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# The California Surveyor

Fall 1999

The Voice of the Land Surveyors of California

NO. 124





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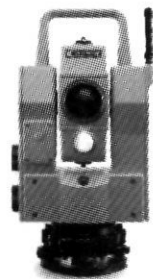
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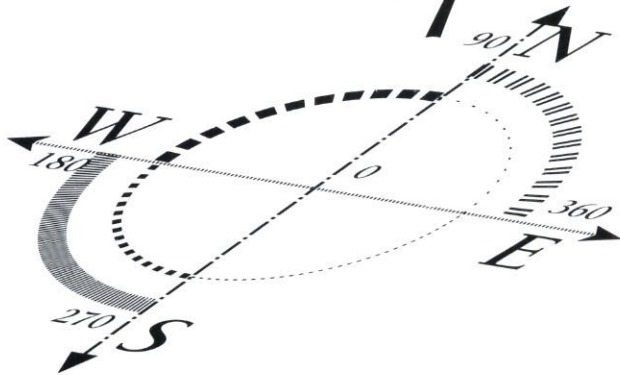
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# The California Surveyor

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"Recognizing that the true merit of a profession is determined by the value of its services to society, the California Land Surveyors Association does hereby dedicate itself to the promotion and protection of the profession of land surveying as a social and economic influence vital to the welfare of society, community, and state."

"The purpose of this organization is to promote the common good and welfare of its members in their activities in the profession of land surveying, to promote and maintain the highest possible standards of professional ethics and practices, to promote professional uniformity, to promote public faith and dependence in the Land Surveyors and their work."

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## DEADLINE DATES

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Articles, reports, letters, etc., received after the above mentioned date will be considered for the next edition.

*Opinions expressed by the editor or individual writers are not necessarily endorsed by the California Land Surveyors Association Officers or its Board of Directors. Original articles may be reprinted with due credit given to the source and written notification to the California Land Surveyors Association.*

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## On The Cover

Instrument man William J. Frost at a  
Boy Scout Jamboree in 1953.

Submitted by Pat Tami



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# From the Editor

## ALMOST THE END!

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By: Phil Danskin, PLS

---

Can you believe it? I thought 1999 would take forever to pass and here we are - nearly at the end of it, the beginning of the Y2K fiasco and a Big One for the Gregorian Calendar! Got your coffee can full o' money buried in the back forty? Computer Y2K compliant? Who gives a darn?

Cousins, I love this job . . . but, business has been so hectic. (That may explain the lack of response to our last issue.) Those with the longevity in this profession know it is wise to *make hay while the sun shines* - showers are around the corner. But for those that did respond - thank you!

A couple of considerations were brought up in the letters to the editor. One is the need to have affordable *and* convenient continuing education. Ted Kerber suggested on-line courses . . .

*"Frank! Frank! Remove that rope from 'round your neck! And don't kick the horse before ya do so!" Just what Webmaster Demling needs!*

Sorry, for that brief interruption.

Considering the first suggestion and being a "nonprofit," maybe the seminar committee can come up with a great seminar to pay the card-carrying participant's a dividend - *substantially* inexpensive! Is it necessary for *our* seminars to profit *every* time? Understandably, there are great risks in sponsoring seminars. Could CLSA afford the suggestion?

Could the Seminar Committee consider a **BIG** discount to seminars, for the bonafide member?

Onto something different! Notice the new section of the California Surveyor which is dedicated to honor our elders. As a former volunteer fireman we had Old-Timers Night. In the fall, there would be at least one member that was fortunate enough to bag a deer (for us, not the deer). We would honor the old timers with a polenta feed. All would eat, drink, be merry, and listen to tales from the Wise and the Not-So-Wise. And if the old-timer is really an *old-timer*, you may hear those stories more than once. And if the old-timer is really an *old-timer*, you may hear those war stories embellished more than once. All learned something and made special bonds from these dinners.

I propose (*Phil, who made you king?*) that the chapters entertain the idea of an Old-Timers Night. Bring a camera and forward a photograph of the event, with a blurb to the California Surveyor. Let's get our older cousins to a meeting! If they're worthy - buy 'em a dinner!

This could be your opportunity to hear local survey lore, tools

of the trade and may well pick up pointers on the exact location of important monuments.

What do you think? (If I don't get a response . . . I'll know what you thought of the idea.)

### At the last Board meeting . . .

California Spatial Reference Center (they perform some "heady" surveying) is **EXTREMELY** important to *ALL* the citizens of our state! NGS no longer maintains the leveling/geodetic surveys necessary to determine if the sewers flow the correct way, etcetera. Those in charge will be long gone (out of office) when the California Aquaduct overflows its banks, or the sanitary/storm sewers no longer function! That'll be a pretty sight at high tide! The aforementioned "the-sky-is-falling-prediction," does not factor the effects of one of California's copious earthquakes! In the past, like a battalion of firefighters, NGS was there inspecting the ground before the tremors and assessing after tremors. The people of this state need the foresight of CSRC. Do you prepare FEMA Flood Insurance Certificates or use a CORS site? If so, our profession not only needs CSRC, but like the NGS we will come to depend upon it! Please support CSRC!

### Let's get Cooking!

We need to address future legislative issues. This should be a collective effort with unanimous support by our members and related societies. Let's set a goal: by the end of 2001 to fix the Record of Survey. The bottom line on this issue is fees!

A Record of Survey is a recorded opinion of a survey. It does not impart "constructive notice." Therefore, why do we get our dander up over an opinion? It is an opinion. As pilots must scan their instruments, interpret what those instruments are telling them, and take actions based upon those interpretations, the surveyor, like the pilot, must scan a Record of Survey, interpret what purpose the map was (ie Lot Line Adjustment, Agreement Line, Boundary opinion, Control survey, etc.) and take action on what is useful to the task at hand and what is not.

For example, you are retracing a 1950's California Department of Transportation right-of-way. The right-of-way is purporting to be on NAD '27 co-ordinates. Subsequent CalTrans widening project discovers that one of the *closing* monuments at one end of the project was in error. Back to basics: *retrace the footsteps of the original surveyor(s)!* (Maybe one we would fete on Old-Timers Night.)

*Read* the title of the Record of Survey. Does it indicate that it is for the purpose of a Lot Line Adjustment? Some courses may be for closure purposes and not surveyed. Interpretation: Use this survey to retrace the adjusted boundary.

Most agree that recording surveys are better than not. Our organization should meet to discuss funding, liability and responsibility with the County Surveyor's Office. Understand where he/she is coming from. Find out what it would take (legally) to get a \$100 (in 1999 dollars) survey checked or recorded? Maybe we could have a Hold Harmless Clause in



future R.S. legislation. The liability would then be placed where it belongs - on the surveyor! Is it in the best interest to request the County Surveyor to check virtually *everything*? If so, the client would pay twice for it and there could be another opinion! Doesn't the authority to police our profession lie squarely on the shoulders of the Board of Registration?

### Accommodate those that can't . . .

This past summer a large group of family members camped at Lake Collins in the Northeast Lands. Some heady intercourse ensued shortly *after* a few shots of Horditos tequila. The crux of the conversation was on the topic of addiction and tolerance. A very compassionate and intelligent member of our family could not fathom addiction. He thought the addictive person was a spineless one. At one time I thought the same.

Just because we're professionals doesn't make us immune to the disease. The next time you see that homeless person, wreaking of alcohol, dumpster-diving, think. Have some tolerance. He/she could be a fellow surveyor a few steps subsequent to an erroneous construction staking.

There may be a loved one with the addiction. It could be a faithful and hard-working employee. And it just might be the person in the mirror. My sincerest prayers and wishes are with those with, and related to, The Disease. May your Higher Power always be with you.

*"Phil, what's this got to do with a surveying journal?"*

Being the Fall issue it may be apropos to share the following. Attempt sensitivity to those living with The Disease. With upcoming celebrations of Halloween, Memorial Day, Thanksgiving, Christmas, Chanukah, New Years, etcetera, some people/businesses believe plying alcoholic beverages to their guests is high form of hospitality. To some, it is. To those living with their sobriety it may pose an uncomfortable situation. So, when you throw a party show sensitivity and awareness - include those who are fighting, daily, the tiger within and be considerate to have, non-alcoholic beverages for them. It would hospitable to say, "may I offer you a beer, wine, non-alcoholic beer or wine, or soda." This would show that you have the same sensitivity that one might give to a vegetarian or diabetic.

Sorry to go *heavy* on you. This editorial must have been as smooth to read as a ride in a car with square tires.

Isn't the spirit of the holidays sensitivity and tolerance?

All your cousins at CLSA sincerely wish you and your family Happy Holidays and a prosperous upcoming New Year!



## Old Timers Corner



This picture was taken in 1981 at the Franco Hotel in Castroville, California.

*Standing left to right George Darling LS 3293 (1965); Stanley Smith, deceased, LS 2265 (1941); Robert Baldwin LS 2678 (1951); John Cadiante LS 4407 (1976); kneeling left to right Stan Nielsen LS 3233 (1964); George Dunbar LS 3666 (1969). There is 222 years of surveying in this picture.*

All have been teachers, mentors, historians, storytellers and friends to all they have met.

Submitted by Rod Raudstein

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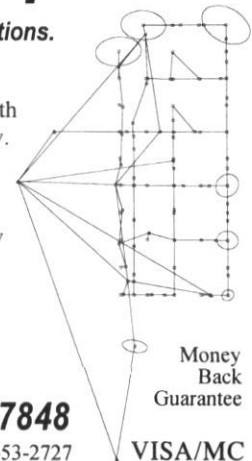
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# The Breakdown of the Land Surveying Profession

## *What you should know about the proposed NCEES Land Surveyors' Model Law*

by Steve C. Wilson, PLS

In the Winter issue of the California Surveyor, proposed changes to the National Council of Examiners for Engineers and Surveyors (NCEES) Model Law were presented. There have been some recent changes in the Model Law that should be thoroughly understood by all Professional Land Surveyors. The latest changes if adopted by your state board of registration would separate the current areas of land surveying practice into two distinct types of Surveyors. To better understand the rationale behind these changes it is necessary to understand some of the history about the Model Law.

The 1995 Model Law definition of the practice of land surveying included, "... measuring and locating lines, angles, elevations, natural and man-made features in the air, on the surface of the earth, within underground workings, and on the beds of bodies of water for the purpose of determining areas and volumes, for the monumenting of property boundaries and for the platting and layout of lands and subdivisions thereof, including the topography alignment and grades of streets and for the preparation and perpetuation of maps, record plats, field note records, and property descriptions that represent these surveys and such other duties as sound surveying practices could direct."

Changes in the Model Law shortly thereafter incorporated the use of photogrammetric techniques and technologies within the definition of the practice of land surveying. When the photogrammetric community became aware of the revisions to the Model Law, a number of concerns were raised. In 1997, a Task Force was formed of five (5) separate organizations. Each organization affirmed its support for the concept of licensing and/or registration of both photogrammetrists and GIS specialists and agreed on a goal of collectively presenting to the NCEES a proposed course of action which would alleviate the common concerns with the existing version of the Model Law.

The original composition of this Task Force, facilitated by Jim Plasker, Executive Director of ASPRS, consisted of two representatives from each of the following groups:

American Congress on Surveying and Mapping, ACSM

American Society of Civil Engineers, ASCE

American Society for Photogrammetry and Remote Sensing, ASPRS

Management Association for Private Photogrammetric Surveyors, MAPPS

National Society of Professional Surveyors, NSPS

As previously reported in the Winter issue of the California Surveyor, the December 1, 1997 report from the "Task Force on the NCEES Model Law for Surveying" appeared at the August 1998 Annual Meeting of NCEES in Honolulu, Hawaii. That report proposed that a "3-tier" licensing approach would be used. Upon passing a fundamentals examination covering measurement and science basic topics, the applicant would be a "Surveying Intern". A second examination termed principles and practices would be taken, resulting in the designation of "Geomatics Professional". The "Geomatics Professional" was proposed to be licensed to perform some of the tasks presently protected by California law (and by about one-quarter of the other states) as the practice of the Professional Land Surveyor. Those tasks included topographic mapping, GPS surveys, GIS/LIS work, construction staking, geodetic surveying, etc. Step three would be for those holding the basic "Geomatics Professional" license who gain experience in land boundary determination and pass a jurisdiction-specific exam in boundary knowledge and practice. That person would be called a "Professional Land Surveyor". The only areas of practice in the original proposal (presented in August 1998) reserved exclusively for the Professional Land Surveyor were boundary and legal surveys.

CLSA has taken a strong position opposing the original recommendations. We voiced our concerns at the NCEES-POLC (Participating Organizations Liaison Council) meeting in Dallas, Texas in February 1999, and at the NSPS Board of Governors meeting in Portland, Oregon in March 1999. The combined efforts of our NCEES-POLC liaison Howard Brunner, and action by the Board of Directors of CLSA has raised the awareness of this issue. The Western Federation of Professional Surveyors Chairman Jim Dorsey, at the meeting held in Portland, Oregon during March 1999, also brought this issue to the forefront. These combined efforts resulted in the deletion of the "Geomatics Professional" from the original proposal. The revised Task Force recommendations, as represented to us at the NSPS Board of Governors meeting in March 1999, were being modified to bring all of the elements formerly proposed for the Geomatics Professional into the jurisdiction of the Land Surveyor. This was with the provision that each person's practice be restricted to only those areas where the person is truly competent. This was further confirmed by Jim Plasker, Executive Director of ASPRS, later in March of 1999 at the panel discussion which took place at the CLSA / NALS Joint Conference in Sparks, Nevada. We further learned at the NCEES Western Zone meeting held in Monterey, California in April 1999 that the original proposal had been stopped. This is an excellent example of what your association can accomplish on your behalf.

Regardless of what was being represented to us, the Uniform Procedures and Legislative Guidelines Committee of NCEES (UP&LG) was moving forward with one of its charges, "To continue to review the Joint Surveying Task Force report and make proposals to modify Model Law as and if appropriate."



The latest proposed changes to the NCEES Land Surveyor's Model Law appeared in the Annual Convention Reports for the August 1999 Annual NCEES Meeting which was held in Buffalo, New York. They are in the report prepared by the UP&LG Committee. The main points are:

- The title of the Professional Land Surveyor will be changed to "Professional Surveyor or Land Surveyor". This change is consistent through the entire document.

- The Land Surveyor Intern, meaning the person who has passed the fundamentals examination (LSIT), is being changed to simply "Surveyor Intern".

- The definitions of the practice of "surveying or land surveying" includes, but is not limited to the following:

(a) ~~Determines~~ Determining the configuration or contour of the earth's surface or the position of fixed objects thereon by measuring lines and angles and applying the principles of mathematics or photogrammetry.

(b) ~~Performs~~ Performing geodetic surveying, which includes surveying for determination of the size and shape of the earth utilizing angular and linear measurements through spatially oriented spherical geometry.

(c) ~~Determines~~ Determining by the use of principles of ~~land~~ surveying, the position for any survey control (non-boundary) monument or reference point; or ~~sets, resets, or replaces setting, resetting, or replacing~~ any such monument or reference point.

(d) ~~Creates prepares or modifies~~ Creating, preparing or modifying electronic or computerized data, including land information systems, and geographic information systems, relative to the performance of the activities in the above described items (a) through (c).

(e) ~~Locates, relocates, establishes, reestablishes, lays out, or retraces~~ Locating relocating, establishing, reestablishing, laying out, or retracing any property line or boundary of any tract of land or any road, right of way, easement, alignment, or elevation of any of the fixed works embraced within the practice of engineering.

(f) ~~Makes~~ Making any survey for the subdivision of any tract of land.

(g) Determining, by the use of principles of land surveying, the position for any survey monument or reference point; or setting, resetting, or replacing any such monument or reference point.

(h) Creating, preparing, or modifying electronic or computerized data, including land information systems and geographic information systems, relative to the performance of the activities in the above described items (e) through (g).

- Under Section 14, Examinations: Principles and Practices of Surveying or Land Surveying ~~Land Surveyor~~-- A sentence has been added that says: "The board may elect to waive any

additional written examination requirements for the performance of the activities described in Section ... (a) through (d) to facilitate mobility between jurisdictions.

The rationale as contained in the UP&LG Committee report further explains:

- "The order of the definitions have been reorganized to include "Geomatics Practice" under subsections (a) through (d), and the "Land Surveyor Practice" under (e) through (h), all included in one definition and a more simplified dual title of "Professional Surveyor or Land Surveyor".

- The purpose of reorganizing the order of the items in the definition was so that a waiver clause could be inserted into the Examinations Requirements to enable each jurisdiction (state) to have the option to "elect to waive" the jurisdictional-based examinations (boundary surveying) for the geomatics-related practice described in (a) through (d).

These proposed Model Law revisions were initially on the consent agenda at the Land Surveyors Forum in Buffalo. The consent agenda would allow for no discussion. The NCEES-POLC representative from CLSA, Howard Brunner, requested these proposed changes be placed on the agenda. These proposals were then discussed at the Land Surveyors Forum, and subsequently were approved by the full NCEES Council at Buffalo, New York in August 1999 with very slight amendment. This means the Model Law is now revised to include those changes outlined above. In summary, those changes are:

- Each state has the option of adopting any or all portions of the NCEES Model Law. If adopted, this Model Law would allow a de-facto separation of the practice of Land Surveying into two separate classifications. The "Geomatics Practice" as defined by (a) through (d), and the "Professional Land Surveyor", as presently regulated by each state.

- The titles of the surveying practice as defined in the Model Law now have two presumably interchangeable names, "Professional Surveyor" or "Professional Land Surveyor". It appears that "Professional Surveyor" has replaced "Geomatics Professional", however that is not succinctly stated in writing.

- Subsection (h) addresses the concerns that our California Board of Registration expressed in their Policy Resolution #98-03, relative to the practices of land surveying and civil engineering related to Geographic Information Systems (GIS) and Land Information Systems (LIS). There has been some controversy over Policy Resolution #98-03 insofar as many GIS / LIS practitioners believe that our board and the Professional Land Surveyors are attempting to affect a take-over of their work. This is not the case at all. The NCEES language is consistent with the intent of Policy Resolution #98-03. The Professional Land Surveyor's role is primarily the control and boundary elements of the GIS / LIS.

*Continued on page 20*



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# Letters to the Editor

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## “THE L.S. EXAM” PASS RATE

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Dear Editor:

The furor over the L.S. exam has been a long time coming, but I wasn't sure I would live long enough to see it. The apathy and 'I've got mine' attitude of some licensed surveyors caused me to think that a large portion of the profession wasn't all that alarmed by the pass rate. It's encouraging to see that your publication dedicated most of an issue to this %#&\*@#!\* test and its miserably low pass rate.

Unfortunately, once again the candidate and his/her lack of experience and education has been the prime suspect in the perpetration of this crime. I take personal offense for myself and all the others who have studied for literally hundreds of hours and struggled with *The Test*, only to be blamed for its poor results. I've spoken with candidates who took the '97 exam and missed by only 20-30 points, but missed the '98 exam by 300-400! I seriously doubt they became less intelligent or experienced over the last year!

I hope to demonstrate that you're looking at the wrong backsight.

To begin, I have seen genuine concern and effort on the parts of several Board members trying to get to the answer. I was encouraged by a December meeting called by the Board gathering surveyors from all over the state, along with two unsuccessful candidates. The opinions expressed were as varied as the people attending.

Additionally, the Board is given the *impossible* task of compiling a different test each year that is equal in scope, depth, difficulty and time. It's not a bad test, but it is certainly not equal from year to year. To compensate for these and a myriad of other variables, most testing bodies introduce a 'curve' or other adjustment to get the best, true results. From at least 1966 to 1983 the L.S. exam was graded on a curve and the pass rate was an average of +/-33%. In 1984, 'criterion-based' based scoring was introduced and the pass rate plummeted to 5%, then 3.3% in '85 and is now at a new low!

Responding to that change in scoring and its resulting crash, the January-June 1986 ACSM Newsletter quoted Assemblyman Dan Hauser as saying: "The decline in successful candidates during the last two years may be either [due to] the testing procedure or the test itself. It is inconceivable that the quality of those candidates sitting for the exam could have dropped as dramatically as the results of the last two years would indicate. This leads me to believe that there is a problem with the test, its administration, or a combination of the two." The newsletter followed: "If Assemblyman Hauser is correct, it would appear that the Board has either licensed numerous unqualified indi-

viduals, or else in the last two years has failed candidates who were in fact qualified to be licensed."

In keeping with that thought, the average pass rate ('94-'97) for first time test takers was over 50%!! This year's bumper crop of 123 freshmen should have produced 60+/- new L.S.'s rather than the 4 first-timers that passed. I would read Mr. Hauser's comments above again for some connection to this year's results.

The change in scoring is only one part of the problem. The previous tests were available for inspection and study purposes for the past 30 years, but they're now secret, safe from the scrutiny of the survey profession. Likewise, the answers/grading plans were available to unsuccessful candidates up until a couple years ago, and that too has been taken away, certainly not conducive to a successful examination.

The need for secrecy is apparently to keep the present batch of questions secure. While the 'banking' of questions may save the Board some money, what is it costing the 1,392 unsuccessful candidates ('96, '97 & '98) who must study and pay for another exam.

So you still think it's the candidates, eh?

If the test itself is to be faulted, it would be that as the profession has become more complex and multi-disciplined, the test has spread out to encompass all of those new areas and studying for it has become far more difficult. One candidate described it as "trying to hit a moving target...blindfolded!" In the past, the candidate was given optional questions to choose from to more closely reflect his/her areas of expertise, but the present tests require *all* questions to be answered.

There is also a push to require at least eight years experience and another for a 4-year degree before sitting for the exam. The Board's own statistics show that the *pass rate drops as more years of experience are accumulated!* I think that fact alone should raise a red flag as to what's being covered on the test or how it's being administered. Shouldn't more experience *increase* your chances of passing? Further, high school graduates have a pass rate *higher* than those with A.A. degrees and only slightly lower than B.S. degreed candidates. With such dismal results from 'improved' requirements, what are we trying to attain? Professionalism? .....or pretentious elitism?

If there is some blame to be put on the candidates, it would be caused by those licensed individuals who sign for ineligible or marginally eligible candidates thinking that the "test will weed them out." While that may be true, it is no doubt in some part responsible for this year's fiasco and we, as a profession, must be far more careful in signing our names!

So let's review: The Board has taken away grading on a curve.....taken away optional questions.....taken away the old tests.....taken away the previous test's answers.....and now is considering to increase minimally or counterproductive requirements. Now, tell me again why is the '98 pass rate was so low???

Oh, yeah, that's right....it's the candidates.

Gary O'Connor, P.L.S. ❖



## WAS "THE L.S. EXAM" UNFAIR?

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Dear Editor:

Very good deduction! I agree that the solution to passing is preparation. If the pass rate in 1997 was 23.2%, assuming all else equal, by the reasoning of Shasta Greene's article, the plummeting rate was due to the emphasis on law and boundary. How does one learn about law and boundary? Either do it yourself, go to seminars, go to school. School is not a viable solution, as Shasta Greene explained, so let's see about the other options, then see what else can be done.

Do it yourself. It's definitely hard, but not impossible. Number one is to have a good library. Almost all good books have problems with solutions and references to other good books. This is probably the best source of reliable information. It takes a lot of discipline to wade through Clark, then justify what he says with Witkin's summary of California law, but that's how to learn. Study groups are great. Find out who else in your company or your area is interested in learning, and schedule a few hours each week with them, at the library, away from distractions. Pick a topic, discuss it and research it. Then list specific points that need clarification and give a copy to your party chief, or the surveyor in your company, and ask him to the next meeting for his input.

The internet is a good source of quite a bit of legal information on survey law. [Dca.ca.gov/pels/](http://Dca.ca.gov/pels/) is the board of registration for professional engineers and land surveyors, providing links to pertinent California code. [www.leginfo.ca.gov/calaw](http://www.leginfo.ca.gov/calaw) codifies all of California's statutes. The center of a pipe is the legal point of the monument is a state law (govt code, sec. 99999). We all know that by experience, but here's the authority for it, should we ever need it in court. Want to know the legal responsibilities of the county surveyor? Look in the government code. [www.ca-surveyors.org](http://www.ca-surveyors.org) is the CLSA home page, with papers from good surveyors to peruse. Be sure to read Michael R. Mcgee's "The role of the boundary surveyor in the legal aspects of possession, title, and ownerships." I keep a copy in easy reach. There are also court findings with complete case background and decision explanations.

The other option is to go to seminars. Good luck! There aren't many that deal with boundary law, and less that deal with California boundary law, and even less that provide documentation to support their presentation, which is, of course, what's needed when taking the exam. There is a way to attend a seminar and learn, and there's a way to merely end up with a \$200 lunch. Look at the presenter's credentials. For boundary law, the best are California licensed land surveyors with law degrees, or authors of notable books. Avoid those not from California, unless you've been given a valid recommendation. When you sign up for the seminar, find out what specific topics will be covered, and study them. Write down any question your studying gen-

erates, and take the book that caused the question so you will have the reference when you ask the question. Asking questions is the best method of learning at seminars. Don't be embarrassed, you're paying for the opportunity. Want to really learn from a question? Ask a dumb one. Believe me, you will never forget it, and you will never ever need to ask it again. Questions also help you evaluate the speaker for future seminars.

We licensees have to do more. We have to pay attention to who in our charge have the interest in attaining professional status and nurture that interest. We have to cultivate that interest in those that do not show it.

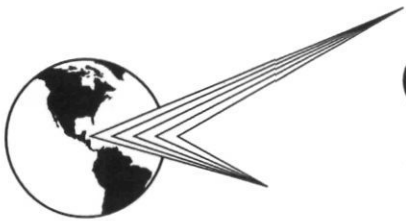
As a party chief, it's a duty to lay out the job before commencing work. Talk it over on the way to the job, but lay it out at the job site so everyone can have the picture. If you're lucky enough to get a lunch break without having calcs to do, go over what was done and explain any decision making process such as why a particular logic or procedure was utilized or rejected, or why changes were made in what was planned earlier. Show what is yet to be done, and how. On the way back to the office go over the completed job and ask for questions.

As a surveyor, copy the field notes and have a crew member reduce the notes to a drawing that contains everything necessary to file a record of the survey. Let him know that it will be his filed RS., Done under your direction. Give him a deadline and when done, critique it with him, and let him correct it. Next, give him a copy of a filed Record of Survey, a copy of the pertinent area of the L.S. Act, and a clean sheet of regulation size paper. Let him prepare the R.S. and tell him it will be filed as though he was signing it. He can do it freehand with pencil, but to scale. Again, give him a deadline, and when he's done, spend the time to discuss it with him. Mark it up with red pencil and let him correct it. When he has finished, draft his map and submit it just as he drew it. When it comes back from the county, let him open the envelope and discuss any corrections, if necessary. When it's filed, give him a copy for his records. It's a good bet he'll keep it forever, and he will learn more that he would at a dozen seminars.

Finally our professional organizations should do more. They can only exist if the profession expands. They provide a tremendous service through well researched articles that provoke well thought out questions that require verified answers. They should do more. They can provide a panel to respond to questions submitted by professionals and those who are trying to become professionals. Advertise this service, and publish the question and the proffered solution. They need to avail their expert advice to their chapters for them to join in the process. Chapters, under guidance by the parent organization, can put on free mini-seminars. Being a paid member provides access to these mini-seminars, which benefits everyone: the parent organizations gain more members, employers gain a smarter work force, and the profession proliferates. A mini-seminar is not hard. It can be simply a 30 minute portion of the monthly meet

*Continued on page 31*





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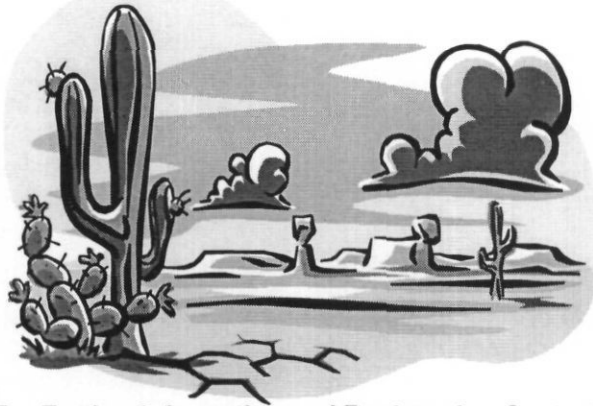
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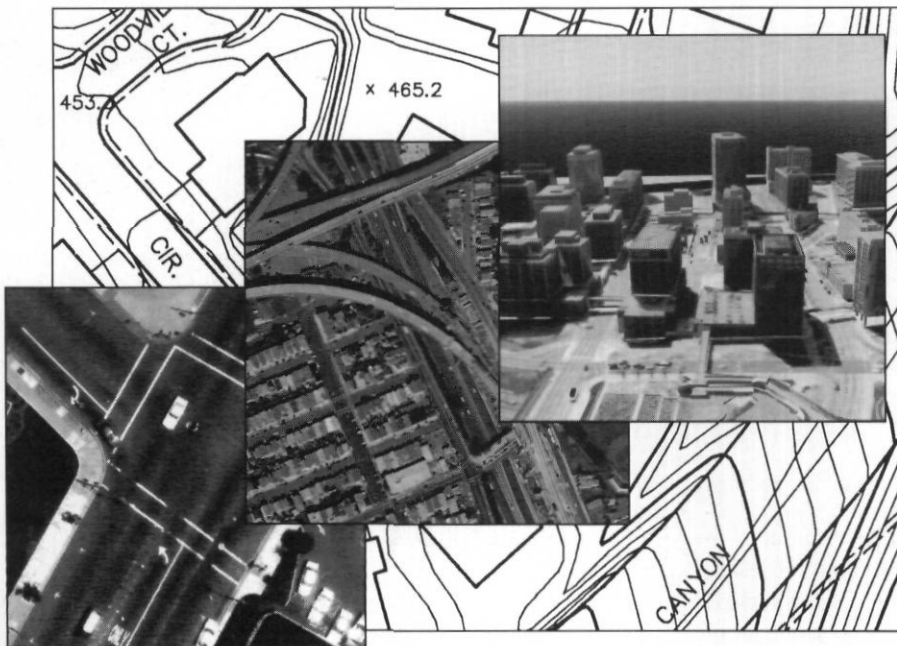
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## “RECORD OF SURVEY CHECKING” REVISITED

Dear Editor:

I suspect your letters on R.S. checking will elicit a lot of comments. Here are mine.

R.S. checking definitely has its place. That place is for the welfare of the public, as all legislation and regulation is purported to be.

While I do not feel the filing of a R.S. does anything for the public except burden their pocketbooks, I do appreciate the additional sets of eyes that keep me from reversing a bearing, *transposing a number, or filing a blunder for all to see*. Mostly, I appreciate the benefit of decreased exposure to liability. As a small business, I have no one to check my work...disaster waiting to happen. The original intent of legislation was a hundred bucks or less to check a R.S., but some enterprising counties have let greed obscure that intent.

My concern with the “examination” of the R.S. has to do with the checkers (county surveyors, since “The examination pursuant to this section shall be performed by, or under the direct supervision of, a licensed land surveyor or registered civil engineer.” Section 8766.) that force their individual map drawing preferences upon us, under the auspices of section 8764. Section 8764 is specifically set apart from the “compliance” portion of section 8766, and given the measure of “substantial compliance,” but few who carry the whip of office seem to care.

We have all encountered, “...to conform to B & P Code, Section...the following corrections are required,” accompanying the copy of our map that is red lined and marked up with red pencil, showing how the checkers want the map drawn, having nothing to do with the necessities of sections 8762.5, 8763, 8764.5, 8771.5 or 8772.

I would like to take the time to cover ground that checkers have let the weeds cover: in 1984, SB 1837 amended Section 8766 (a) from “Its accuracy of mathematical data and completeness of information as required in Section 8764” to “Its accuracy of mathematical data and substantial compliance with the information required by Section 8764.” Section 8766 (b) was changed from “Its conformity to other records or satisfactory explanation of any difference with such other records” to its present form, which properly added compliance with Sections 8762.5, 8763, 8764.5, 8771.5 or 8772.

Does anyone see the blatant mandate telling checkers to get a life!

SB 1837 also added “...or convenient for the identification of the survey or surveyor, as may be determined by the civil engineer or land surveyor filing (now ‘preparing’) the record of survey,” another hint as to who has responsibility and authority over the map, as assigned by the SURVEYOR’S STATEMENT itself, that we (not the checker) sign.

Nothing in the L.S. Act gives authority to checkers to mandate dashed lines for solid lines. Nothing authorizes them to mandate the showing of record data in addition to our own; color of plastic caps, depth of monuments, sheet numbering for one sheet, specific language why 8762 (a) to (g) apply, explanation of the meaning of i.p., o.r., fd... etc., etc. Nothing in the Act requires a lot of the data we include on our maps as a matter of professionalism.

Additionally, we have the bad luck of not getting the same checker we had the previous time. Is that the “direct supervision” mandated by the L.S. Act?

These corrections cost vast amounts of time and money for the counties (remember welfare of the public?) and surveyors. The public is forced to endure additional weeks (months, if one is to contest a correction) while maps are sent back and forth. The surveyor normally will have to replot the entire map, or have it done by the outsource he uses.

Some checkers even go so far as to place a note on your map. It doesn’t matter that the note has no bearing on the L.S. Act, and in fact is contrary to the Act, look at your client’s face when he reads it.

These checkers need to follow the L.S. Act, and realize it is NOT the C.S. Act, and quit acting like a C.S.

*J. Lance Hiller, P.L.S.*

## “GPS ‘N’ GATORS”

Dear Editor:

The proofreader of the article “GPS ‘n’ Gators” in the Summer 1999 edition of *The California Surveyor* missed the erroneous idiom “could care less” in the story’s final paragraph on page 24.

What the author meant to say was “could NOT care less”. Sadly, this biggest of all rhetorical (and written) blunders in American English undoubtedly went unnoticed.

This ignorant bastardization of the language began in the 1960s and its ever-growing prevalence has dumbfounded scholars and pundits. It is simply staggering the number of seemingly intelligent (?) people who are unable to use this phrase correctly.

In a profession where correct language means so much it has no place whatsoever. The late science/science fiction writer Isaac Azimov summed it up best when he said: “I don’t know people stupid enough to say this.”\*

*Lawrence Vincent, PLS 4486*

*\*Harper Dictionary of Contemporary Usage, 2nd Edition, by William and Mary Morris; Harper & Row, Publishers, New York; copyright 1985.*

*How careless of me! - Ed*

## THE "MAGIC NUMBER"

Dear Editor:

In our surveying classes at Palomar College, San Marcos, CA, we used a concept of teaching horizontal curves that I haven't seen covered in any surveying text books, and I thought I would submit it for the consideration of anyone else who might have occasion to use it.

### *The "Magic Number" Method of Calculating Horizontal Curves*

In most surveying books, the explanation of horizontal curves is based on the use of "Degree of Curve" (D) with  $D = 5729.578/R$ . However, anyone who has worked any length of time in surveying knows that horizontal curve data is very rarely given in terms of Degree of Curve, but rather is usually denoted by Radius and Central Angle.

Therefore, an extra step is needed to convert this information into terms of Degree of Curve. Also, any compilation of deflections for various curve stations using Degree of Curve necessitates adding each additional deflection to the previous station's deflection and an error for any particular station then affects all subsequent deflection values to the End of Curve station.

From the above, it can be seen that a more direct and simpler method of curve solution would be desirable.

Another approach might be to consider a circle whose radius is one foot. Then one foot of arc on this circle would subtend an angle of one radian (central angles in horizontal curve nomenclature) =  $360 \text{ degrees} / 2\pi = 57.29578 \text{ degrees per foot of arc}$ , and the total deflection angle would be half of this amount or  $28.64789 \text{ degrees per foot of arc}$ .

If then a circle of two-foot radius is considered, the deflection angle for one radian is again  $28.64789 \text{ degrees}$ ; but since one radian in this circle subtends two feet of arc length, the deflection per foot of arc is  $28.64789/2 = 14.32394 \text{ degrees per foot of arc}$ . Similarly, no matter what the radius of the circle (curve) is, the deflection can be calculated as  $28.64789/R \text{ degrees per foot}$ .

The constant  $28.64789$  is often referred to as the "Magic Number," and since most curves are defined by Radius and Central Angle, the horizontal curve solution using "Magic Number" is much simplified because reference to Degree of Curve (D) can be bypassed completely.

The total Length of Curve can be calculated by dividing the Central Angle/2 by the newly computed Deflection per Foot ( $28.64789/R$ ) or  $L = \Delta/2 \cdot (28.64789/R)$ .

Also, whereas in the case of Degree of Curve method of solution it is first necessary to calculate the deflection angle from the Begin Curve station to the first full 50 or 100-foot station and then add accumulative station deflection increments one to the other to arrive at a particular station deflection or the End

of Curve deflection, with the "Magic Number" method it is necessary only to multiply the deflection per foot ( $28.64789/R$ ) by the distance from the Begin Curve station to arrive at the deflection angle for any particular station.

This lends itself to easy calculator solution; the B.C. station is stored in Memory 1, and the deflection per foot ( $28.64789/R$ ) is stored in Memory 2. Any station desired on the curve is entered in the calculator; then recall Memory 1 (B.C. station) and subtract (= arc distance from B.C.); recall Memory 2 (deflection per foot) and multiply and convert from decimal degrees to degrees, minutes, and seconds, which equals the deflection angle for that particular station.

A closer look at the above shows that there is a relationship between the "Magic Number" method of curve solution and that accomplished using Degree of Curve (D).

For whereas in the "Magic Number" method of curve calculation  $57.29578 \text{ degrees/R} = \text{amount of Central Angle per foot subtended by any given radius}$ , it is seen that, with the Degree of Curve method,  $D = 5729.578 \text{ degrees/R}$ , which equals the amount of Central Angle subtended by 100 feet of arc for any given radius, which, of course, is the definition of D.

Admittedly, the Degree of Curve (D) method has an in-built check on the correctness of the horizontal curve deflections in that, since each station deflection has to be added consecutively one to the other, if the final deflection angle at the End of Curve station equals the full deflection angle (or one-half of the Central angle,  $\Delta/2$ ), then it is known that all the preceding station deflection angles are correct.

However, a similar check can be used with the "Magic Number" method of curve calculation in that whatever curve stations are used (25-foot, 50-foot, 100-foot), the deflection angle increment between stations can be mentally checked by subtracting consecutive station deflections shown on the completed tabulation of curve deflection angles.

Of course, there are programmable calculators that, once the curve station is punched in, the deflection for that station will be generated. However, in the case of students new to surveying, a programmable calculator solution might tend to make them "button pushers," getting the answer without knowing the basic reasoning behind the solution.

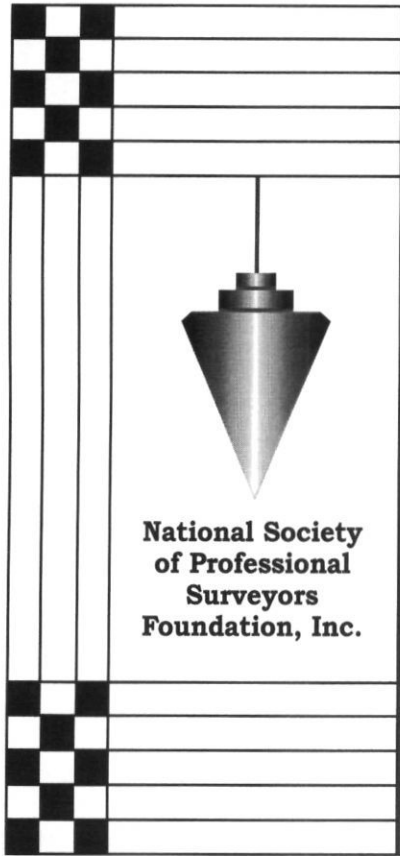
The "Magic Number" solution above can be performed on any basic Trig calculator and almost at the speed rivaling a programmable calculator.

And so it would seem that since the "Magic Number" solution bypasses the need to refer to Degree of Curve (D), which is very rarely shown on surveying or engineering plans, the "Magic Number" method is, in general, a simpler and more direct way of calculating horizontal curve data.

Sincerely,

*Jim Chesney, Instructor (Retired), Palomar College* ❖





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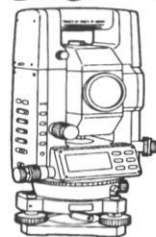
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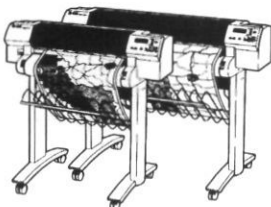
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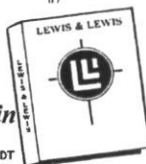
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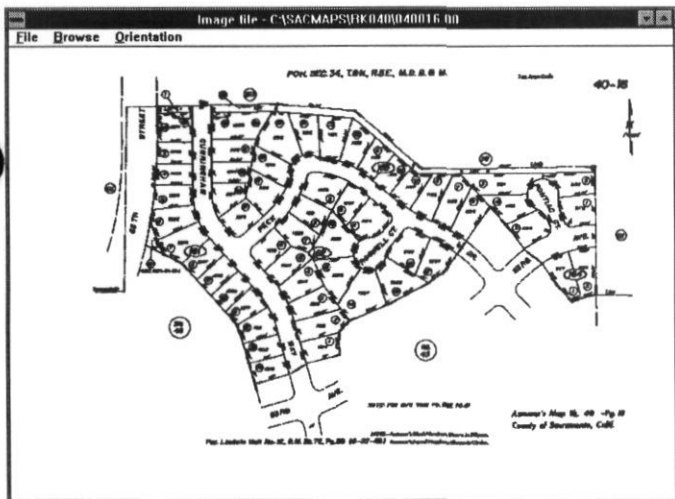
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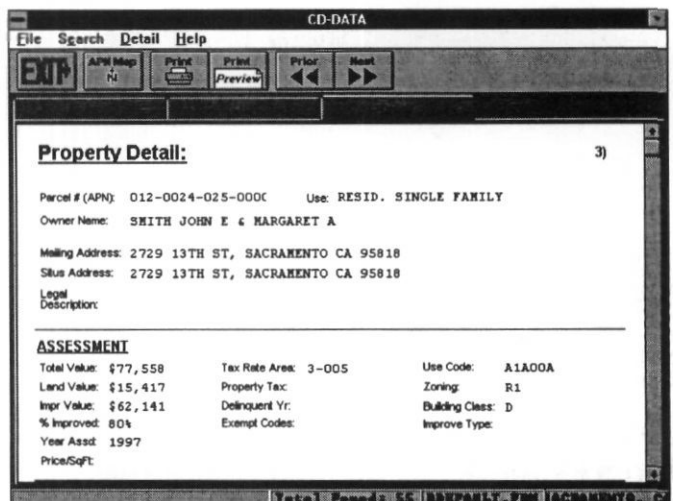
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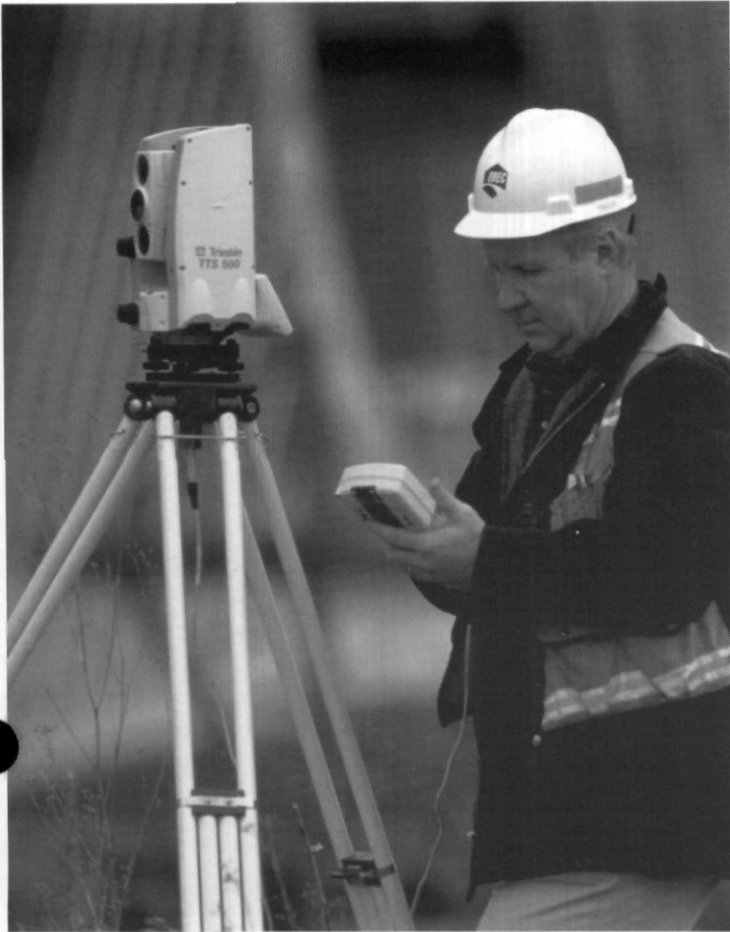
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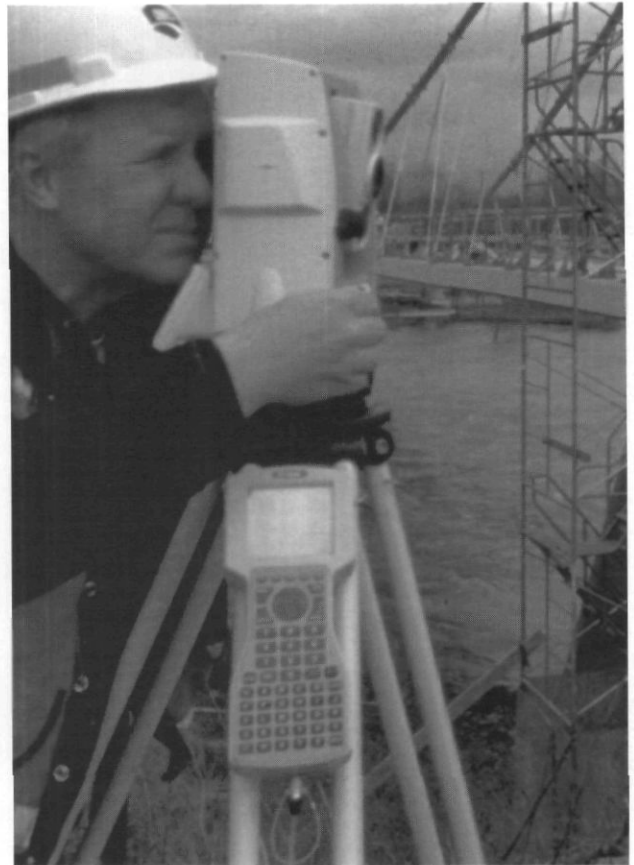
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The newly proposed amendments to the Model Law are really a refinement of the geomatics concept that first appeared in the 1998 convention reports. The latest proposal for the Model Law amendments caught us by surprise. We were led to believe by NCEES that the Task Force recommendations were not being acted upon (or the proper inquiries were not being made during the Western Zone meeting held last April in Monterey). The proposed changes seem, on the surface, to be fairly inoffensive to the Professional Land Surveyor. The newest proposal is somewhat different from the original proposal, the titles have been changed and the affect of its implementation is more difficult to see.

The Model Law Task Force is now being expanded to include some GIS / LIS societies. Invitations to participate have been extended to URISA, NSGIC, and UCGIS. Therefore, now it appears the new Model Law Task Force Committee will consist of two representatives from each of the following organizations:

- American Congress on Surveying and Mapping, ACSM
- American Society of Civil Engineers, ASCE
- American Society for Photogrammetry and Remote Sensing, ASPRS
- Management Association for Private Photogrammetric Surveyors, MAPPS
- National Safety Geographic Information Councils, NSGIC
- National Society of Professional Surveyors, NSPS
- University Consortium for Geographic Information Sciences, UCGIS
- Urban and Regional Information Systems Association, URISA

Of the sixteen potential members of this committee, eight are actually Land Surveyors. I note that only one of these eight organizations is truly a Land Surveyor's group! The fact that half of these persons have licenses as Land Surveyors should not imply that the recommendations they make would be in the best interests of the Professional Land Surveyor. The majority of this task force will actually represent the best interests of the Photogrammetrists or GIS / LIS practitioners. It will be interesting to see what types of recommendations the Model Law Task Force will formulate.

Where does it go from here? There is no question that advances in the ease of spatial data acquisition, automation of field equipment, advances in computer hardware and software, and the widespread use of GPS by trained and untrained personnel alike has intruded into the practices currently defined as land surveying. The real issue is whether a separate class of professionals should perform the geomatics-based tasks.

It is also very logical to assume that NCEES will be someday in the business of furnishing an examination to focus only on the

geomatics-based practices as defined in (a) through (d). Should that come to pass, the division of the land surveying practice would be very clear.

If the division would come to pass, there are significant problems associated with the practices defined by subsection (a). It is impossible to separate boundary line determination from topographic mapping where one of the elements of a topographic map is usually a representation of how the property boundaries relate to the physical features of the land. In most cases, we would find boundary determinations being made by persons not authorized to practice land surveying. There is no practical way to separate this essential element from the portrayal of topographic data. The consumer will not be adequately protected. How would the consumer be aware of how reliable the location of boundary lines, setbacks, easements, etc., truly are unless they are sophisticated enough to seek out a Professional Land Surveyor to do their mapping?

It appears that one objective of these proposed changes is to require the GIS practitioners to be regulated. The issuance of a Surveyors license, especially if entitled "Professional Surveyor" or "Professional Land Surveyor" also should imply that the product of this person's work would then comply with National Map Accuracy Standards. This standard should be the norm with any GIS / LIS. The existing Professional Land Surveyors are the *only ones with the training and experience to make this assessment*. There are significant problems associated with the practices defined by subsections (b) and (c), unless these activities are performed by persons with similar education and experience of the Professional Land Surveyor.

It also appears that NCEES is very desirous of obtaining "mobility" among jurisdictions, which has been very difficult to accomplish with the land surveying profession because of the significant differences in practice that exist among the states. Dividing the practice of land surveying is one way to accomplish this goal. Each of these groups is representing its own best interests. The Professional Land Surveyor is under represented in this process.

This is the time to support your professional organizations. Please also register your feelings about these changes to our practice by writing a short letter to your ACSM - NSPS Area Director, via ACSM, 5410 Grosvenor Lane, Suite 100, Bethesda, MD 20814-2144. If you are a resident of a state other than California, please also communicate your concerns about these developments to your State Land Surveyors Association. We must stand together to protect our profession as we now know it, or be ready to face the consequences. The choice is yours.

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*The California Surveyor, Fall, 1999*

California Land Surveyors Association  
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OFFICIAL ENTRY FORM

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Submit two folded prints for each entry with a maximum map size of 34" by 44". **All entries must be folded to fit in a 9" by 12" envelope.** Submissions must be single drawing; it may originate as part of a set of drawings, however, it must be entered

as a single sheet. **All entries must be postmarked by October 25, 1999.** Use one entry form per document submitted. An entry fee of \$15.00 must accompany each form. Winners will be contacted to send a print for display. The first prize winners will be entered in the ACSM/NSPS Map/Plat Contest if enough entries for that category have been received.

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Categories

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- 4. Unique Maps\* .....

\*(Development plan, "as-builts", unique approaches, etc.)  
(Only one category may be checked)

For judging purposes, entry is to be judged as:  
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Category B. CADD drawing .....

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Santa Rosa, CA 95405

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City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

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Description of Project: \_\_\_\_\_

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Name and address of Nominator if other than entrant.

Name: \_\_\_\_\_

Address: \_\_\_\_\_

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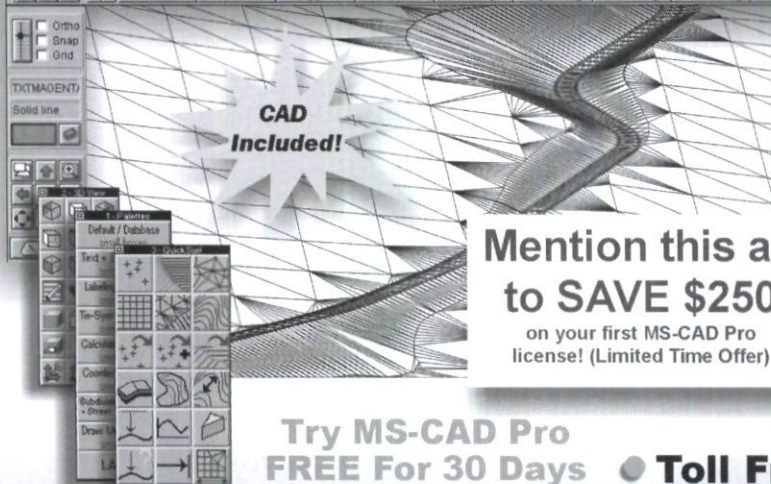
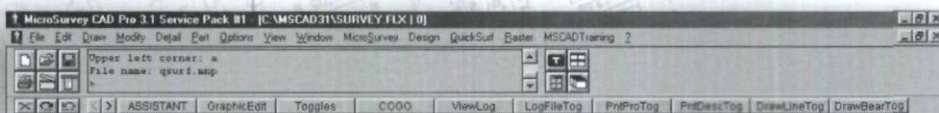
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# Mandatory Continuing

By Knud Hermansen, L.S., P.h.D., P.E., Esq.

*Mandatory continuing education is one of the most divisive topics facing the surveying community today. Here we present two sides of the issue. Opposing the concept is Knud Hermansen, one of the most prominent continuing educators in the country (how's that for a double take?). Defending the notion is Joel Leininger, member of Maryland's Board of Registration. Neither saw the other's argument before writing his own, but each was given a chance to respond to the other's comments. As usual, we invite your reaction.*

**M**andatory continuing education is being pushed by licensing boards and professional societies as a cure-all to many ills afflicting the profession. Supposedly, it will force practitioners to upgrade their skills and knowledge or get out of the profession, expose practitioners to new technology and procedures and instill public confidence that practitioners' knowledge is current.

## Mandatory Programs Fall Short

Unfortunately, studies have shown that most mandatory education programs do not live up to expectations. Like so many other government regulations, the costs, frustration and difficulty exceed the benefits. Knowledgeable educators have warned against imposing a compulsory continuing education program on adult professionals. The typical mandatory continuing education scheme is repugnant to both a professional and adult. How can surveyors claim to be professionals, able to make decisions on the client's behalf, yet admit that they are incapable of deciding for themselves how and when they should pursue further education? A. A. Morrison, an adult education specialist, stated that because of the very fact of being relatively self-directed and trusted to make competent decisions affecting their clients, the professional ought to resist the imposition of compulsory education (A.

A. Morrison, "Resisting Compulsory Continuing Professional Education," *Australian Journal of Adult and Community Education* 1992, p. 146).

Adult education specialists are quick to state if asked that compulsory continuing education violates most adult learning principles. Whereas adult learning principles stress giving learners independence in choosing their education and self-motivation toward learning, compulsory continuing education does just the opposite. Rather than allowing learners to direct their own learning process, mandatory continuing education shifts the decision-making to a government agency or a series of inflexible rules (Sandra Kerka, "Mandatory Continuing Education," *ERIC Digest No. 1511994*). Studies have shown that where there is a failure to abide by adult learning principles there is great risk of ineffective, costly and unprofessional education. Surveys have borne this out. In Illinois, where mandatory continuing education was made effective and later repealed for physicians, most physicians reported that the implementation and repeal had no effect on their patient care. The incidence of malpractice suits stayed the same (Chloe Little, "Mandatory Continuing Education: A Survey of the Literature and a Comment on the Implications for Physical Therapy," *Journal of Continuing Education in the Health Professions* Vol. 13, 1993, pp. 159-167).

The bottom line is that justification for additional and burdensome government regulations should be based on a need or problem that can only be addressed by regulatory edict. This justification is lacking in the professions. In many states, not one surveyor has been disciplined in the past year. In states that have disciplined one or more surveyors, the number disciplined is far less than 1 percent of the state's licensed professionals. To require 100 percent of the licensed population to be bound by

regulations that attempt to alleviate a possible problem that is caused by less than 1 percent of the licensed population would be absurd under other circumstances. It is akin to using an elephant gun to kill a mouse.

## Surveyors Stick With What They Know

The argument is made, with justification, that a practitioner needs continuing education to handle and understand the rapid advances in technology, new procedures and so forth that are sweeping the profession. However, most practitioners do not venture into areas they are not familiar with or prepared to encounter. A surveyor who has been practicing for 20 years is not about to buy a GPS receiver and start using it without some training. Most surveyors are well aware of their experience, knowledge and limitations. In many states with mandatory continuing education, surveyors are often forced to take courses in subject areas they have no interest in to get enough hours. A course on the latest developments in GIS is wasted on a person who will never use GIS. The surveyor who exclusively performs retracement surveys is not aided by taking 20 credit hours in subdivision design. (In contrast, seminars in specialty areas in which some individuals practice are prohibitively costly or non-existent.) Those who venture into new software, technology or practice areas usually do so in the way such new areas have always been explored: the buyer either gets the seller to show him or her how to use the technology or software or hires a new employee familiar with it. The vast majority of those who venture into new areas without taking classes from the retailer or hiring new employees would attend continuing education classes regardless of whether attendance is mandatory.

*Continued on page 26*

# Education -- For & Against

By Joel Leininger, L.S.

The debate rages on over whether to require continuing education for surveyors. Curiously, I have never heard anyone deriding continuing education itself. Perhaps this is because education enjoys an implicit presumption of merit (like motherhood and patriotism) and thus is immune from charges of unacceptableness. When the education becomes mandatory, however, many surveyors balk at the idea. To be sure, the notion of government mandating additional obligations onto overworked surveyors is repugnant to some. Also, it is possible that a program could be so poorly implemented as to negate most of its potential benefits. However, to presume that the downsides outweigh the benefits without exploring both gives rise to suspicions that the value of education itself is questioned.

## Continuing Education Protects the Public

Although continuing education should be important to surveyors because of a professional obligation to remain current in their approach to practice, mandatory continuing education has as its goal the protection of the public. This is an important distinction because it clarifies and focuses the underlying motivation of the requirement. If the public maintains an interest in ensuring that surveyors render acceptable service—and it must, or licensing itself is a sham—then the public may take steps to see that surveyors remain proficient. This is a motivation entirely apart from a professional's obligation to stay current with developing trends.

Mandatory continuing education has had roller-coaster swings in popularity over the years. Originally conceived as a means to mitigate knowledge obsolescence in fast-changing fields such as medicine, its image suffered when some studies found that there were no measurable benefits resulting from attendance. Subsequently, heated

debates arose over the prudence of requiring participation.

It is true that mandatory programs carry no guarantee of benefit. Of course, that can also be said of nearly everything else in life. The effectiveness of any educational program depends on the quality of the presentation, the relevance of the subject matter and the ability of the participants to understand the material. All professions potentially benefit from such activities.

For the surveying community, the exercise has peculiar value because we have peculiar needs. First, our practice is unlike that of most other professions in that most practitioners do not share a common educational foundation. Moreover, there is anecdotal evidence that even the 4 year surveying degrees do not adequately cover the subjects necessary for effective practice. In other words, the technical aspects of our work likely were learned by informal tutelage, and, as a result, could be deficient in not-so-subtle ways. Thus, a significant failsafe against error-prone conduct, formal education, is absent.

Second, surveyors tend to practice in situations where opportunities for doctrinal dialogue are limited. For example, most surveyors in responsible charge of surveys are in responsible charge of surveys conducted by that organization. This indicates centralization of responsibility, which in turn indicates isolated professionals. As a result, chances for informal consultation with peer surveyors are infrequent. Such a situation would be tolerable if our formal educational foundations were generally sufficient, but that is not the case. Moreover, off-campus activities provide occasion to get out of the office and talk with other surveyors, enabling us to monitor the evolving standard of care. This is especially important once we reach that career stage when most of the learning curve has been overcome and we develop habits that, left unchecked,

could last the whole career. Plato said, "The unexamined life is not worth living." We should take that to heart. Some of the most egregious standard-of-care violations result from surveyors using practices long outdated.

## Practical Experience Aids in Learning

There are other benefits as well. Adult learners have the advantage of being able to weigh the material covered in light of substantial experience. During a period of initial education, such as in a 4 year degree program, students have limited ability to consider the relevance of the subject matter in light of real-world experience because they've had no chance to gain that experience. There is no question that experience clarifies and illumines the material, resulting in enrichment. That same experience allows the adult learner to explore with the instructor those areas that seem to conflict with common custom (as he or she understands it). As a result, the discussions can lead in new directions, to the benefit of all participating, and perhaps induce meaningful practice changes where necessary.

It is obvious that many surveyors routinely attend educational sessions and thus probably would notice little impact from a mandate to do so. If we can agree that continuing education is beneficial, what must we conclude about the half or more of the surveying population who do not regularly participate? Are we to conclude that their practice is as capable as those who attend? Probably not. In fact, the sole effect of *mandating* continuing education is to reach the large percentage of surveyors who rarely, if ever, continue their education to the detriment of their clients. A few respond by asserting that compulsory education is valueless because the unwilling participants "tune out" during the session and are thus

*Continued on page 27*



Mandating continuing education using the typical regulations such as those proposed by NCEES simply will not work even if there is a problem. [Many educators point out what should have been examined by many states' there is a lack of any evidence showing a positive relationship between mandatory continuing education as proposed and continuing competence (Morrison 1992, citing J. W. Nelson, "Mandatory Continuing Professional Education," 1987).] Mandatory continuing education mandates attendance, not learning, motivation, desire, need or attitude. Consequently, mandatory continuing education has little impact on the small population of the profession that its implementation was meant to change.

#### Startling Revelations

In Maine, Wisconsin and other states where agencies have conducted research on the efficiency and need of mandating continuing education, there have been some startling revelations. Not only is there often a lack of a rational basis sufficient to impose new draconian rules on professionals, the studies show that mandating continuing education has little or no influence toward protecting the public's health, safety and welfare. For example, Maine's Office of Policy and Legal Analysis reviewed the need for mandatory continuing education for surveyors. Its draft report stated, "Continuing education seems like 'God and mother love.' However, the large majority of the literature on the subject says that continuing education does not improve competence."

Colorado's RN Board, with more than 10 years of experience in mandating continuing education, determined that mandatory continuing education not only did not improve competence, it did not decrease the frequency of incompetence.

*After hearing testimony from several nurse educators and others at a January 28 meeting, the board voted unanimously to repeal the requirement that registered nurses complete 20 hours of continuing education every two years*

*to renew their licenses.*

*"In place since 1981, the requirement has been a topic of board discussion over the last two years," said Linda Fleming, education consultant to the board. After auditing licenses throughout the entire period the requirement was in effect, the board found that at least 95% of RNs in Colorado were in compliance, but the number of complaints against nurses kept rising. "There was never any evidence that those with complaints against them hadn't done their continuing education," Fleming noted.*

*She added that, among those testifying during the board's hearing, there were none who were unconnected with the continuing education industry. Initial reaction to the board's decision, though in some cases vehement, appeared evenly split pro and con and quickly died down, she said.*

*In a statement released in February, the board also noted, "There is no research available either in Colorado or anywhere in the nation that shows any correlation between linking continuing education with license renewal and the continued competence of any licensed group." Board resources should be concentrated "in areas that are demonstrably related to public protection." (Copied from Professional Licensing Report, Vol. 6, No. 8, p. 2, February 1994)*

The engineering board within the Wisconsin regulatory department examined the topic in some detail and stated the following:

*The [Engineering] Section has been reviewing CEU policies in other states and recently had a presentation by the Department's Education Coordinator. The presentation included information on research regarding effective continuing education. The research shows the need for the education to be related to current changes in the profession; and, that testing to prove competence is necessary to have the time, effort and money spent on continuing*

*education prove its worth. The Section felt that it would be difficult to establish specific needs in this field because of the diversity of the types of engineering, thus will not pursue required continuing education at this time. Comments from the Professional Engineer Section, Wisconsin Regulatory Digest, Vol. 4, No. 1, June 1995.*

These arguments beg the question: why doesn't mandating continuing education work? Logic suggests it should work. Surely, more knowledge forced on practitioners has to be an improvement. Educators familiar with the subject suggested some reasons why mandating continuing education does not work. First, most people attend seminars on subjects they enjoy and are familiar with already. Practitioners attend seminars not so much to learn something they do not know as to reinforce their belief that what they do and how they currently practice is correct. If a speaker lectures contrary to the listener's belief or practice, the typical listener presumes the speaker is not competent and is wrong rather than considering that the opposite may be true.

#### Some Attendees Tune Out

Second, educators are well aware that when people are forced to attend classes, many people show their displeasure or lack of interest by turning off to the speaker. They day-dream, sleep or simply fail to pay attention. Unfortunately, the same apathetic attitude that causes some practitioners to practice haphazardly or not keep pace with emerging technology also causes them to listen and learn haphazardly when put in a situation where they could learn. (This argument follows the old saying, "You can lead a horse to water, but you can't make it drink.") Those who benefit most from mandatory attendance are the practitioners who would ordinarily attend without compulsion. Colleges and schools have known this fact since the dawn of formal education. Educators in these settings require specific courses,

*Continued on page 29*

deprived of any benefit. I doubt it. As one interested observer noted, "If compulsory attendance is valueless, then better explanations are owed fourteen-year-old boys." Even though voluntary education is preferable, mandatory education is better than none. Although some may prefer to sleep in the back of the room, I suspect the vast majority will "make the best of it" and at least attempt to get their money's worth out of the experience.

The benefits of continuing education are clear, especially given the current state of our profession. However, persistent arguments surface that appear to mitigate its necessity. Let's explore them:

There is no evidence of a competency problem. Some have pointed to the tiny number of complaints lodged against surveyors as evidence that surveyors do not need additional education. The problem with this logic is that it takes an informed consumer to realize that he or she has been harmed before a complaint will be filed. Almost without exception our clients have no idea how we go about our work and thus have no means to determine whether we have performed in a competent manner. Much of our work concerns abstractions such as measurements, rules of construction or error ellipses. Clients have no obligation to understand any of that. Most complaints, not surprisingly, concern not the raw competence of the surveyor, but the cost of the work or its timeliness. In fact, although no one has hard numbers on this sort of thing, I would venture that fewer than five percent of complaints center around a client-identified competence issue.

It is difficult to grasp the perspective of this without attaching numbers to the discussion. Assume that a certain state has 1,000 registered surveyors. A rough estimate of the number of surveys (of all kinds retracements, topography, mortgage inspections and so forth) that each surveyor is responsible for (signs and seals) each year is 200. (This will vary from surveyor to surveyor, but 200 is probably a fair average.) That works out to be 200,000 surveys of all types being

performed in that state yearly. Now, I've not heard of any state having more than 200 complaints against surveyors in a year (and most have far fewer), but let's assume that this state averages 200 complaints per year. If the number of complaints were any measure of satisfaction, these numbers look pretty good; the percentage of surveys generating complaints is 0.1. If only 5 percent of those complaints concerned competency, the percentage of total surveys drops to 0.005. No practicing surveyor would be fooled into believing that only 0.005 percent of surveys each year had a significant incompetence component. Indeed, if every complaint concerned incompetence, the percentage would still only be 0.1. Clearly, this is inconsistent with what we know through retracement. Therefore, the number of complaints cannot be used as an argument for or against anything. But don't take my numbers for granted; use the real numbers from your state. You'll probably conclude as I have done. This is not to imply that mandatory continuing education would instantly cure any incompetence problem, but if the surveyors most at risk for incompetent work are exposed to correct doctrine, perhaps for the first time, meaningful changes are possible.

Surveyors take the same types of courses again and again. Some have objected that surveyors stay within their "comfort zone" when attending seminars, taking the same courses again and again instead of diversifying into new areas. From the perspective of the profession, this is not an encouraging sign. If we are to avoid being "boxed" into a narrow sphere of practice, we must actively seek out new areas of expertise--and seminars provide a convenient way to sample them.

But from the public's perspective, staying within a comfort zone is a wonderful idea. Our comfort zone probably encompasses our area of practice. For instance, if we enjoy and are proficient at GPS surveying, two things are likely: first, we are employed in such an activity (or are seeking employment

as such), and second, seminars we attend will be on the same subject. From the public's position, this is perfect. Think of it: if the public is to be protected, it is important to have providers up to speed on their primary activities. Should they also want to be proficient in other facets of the practice, that would be marvelous, but the primary concern must be for them to be proficient in what they are offering to the public. Thus, the tendency to stay within the "comfort zone" when attending seminars is an ideal situation. Here is an instance where it is necessary to focus on the ultimate beneficiary of the requirement--the public--to grasp the distinction.

This is just a ploy to make money for the course providers. This argument really has no merit. In fact, one could use it against any activity, no matter how essential. (For instance, fill in the blanks with any occupation: "requiring \_\_\_\_\_ is just a ploy to make money for \_\_\_\_\_ers." Obviously, some activities are of such import that the community may require them. Examples are immunization shots for children, speed limits and license tags for automobiles, licensing for practicing certain occupations and so forth.

It costs too much. This is an interesting contention. Obviously cost cannot be considered in the abstract because as such it is meaningless. (Is \$25.00 expensive? For a paper clip, yes; for a computer, no.) Cost must be evaluated within the context of value. The value of continuing education is an enhancement of the practice itself. When considered as such, it becomes apparent that the time spent in honing one's knowledge, plus the small amount to cover the costs of the presentation, is a small price to pay for the privilege of a deeper understanding of the theories associated with surveying. Also, if it were too expensive, how is it possible that so many surveyors have participated thus far?

At some point the arguments against mandatory education must be considered in light of the general human tendency to do no more than is absolutely necessary.

*Continued on page 29*





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 Total billings for land surveying services: Past Year \_\_\_\_\_ Current Year \_\_\_\_\_  
 No. of employed staff: Surveyors \_\_\_\_\_ Draftsmen \_\_\_\_\_ Chainmen \_\_\_\_\_ Clerical \_\_\_\_\_  
 Are subcontractors used?  Yes  No If yes, are certificates of insurance obtained?  Yes  No What % of your work is done by subcontractors? \_\_\_\_\_ %  
 Current Carrier \_\_\_\_\_ Past year's premium \_\_\_\_\_  
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exams, homework and papers to force study and understanding. Consequently, mandatory continuing education could be effective but only where specific seminars that include exams that must be passed to receive credit are mandated or where there is periodic re-testing for licensure.

Contrary to popular belief, many professions have soundly rejected mandatory continuing education. Maine's legal profession and professional engineer board recently rejected mandatory education by majority votes. A poll of members by the American Society of Civil Engineers indicated that a substantial majority of members rejected mandating continuing education (3 to 1). Some legislatures have ignored the clamor by professional groups and closely examined the facts, costs, and realities of enforcement. These legislators, to their great credit, have rejected mandating continuing education because of its high cost and the lack of data as to its value.

Before we, as a profession, rush to adopt more government regulations let's satisfy ourselves first that there is a problem that must be addressed by regulation and second that the regulations proposed will effect the cure sought. All of us have worked with regulations that were passed with good intentions but have evolved into a bureaucratic morass—causing more trouble, cost and harm than they sought to cure. Let's get the facts and choose the right medicine before blindly mandating continuing education. I am against mandatory continuing education but I am 100 percent in favor of continuing education. I understand the value of education and its continuation throughout one's professional life. Certainly as an educator, I am strongly in favor of continuing education for its ability to move our profession and society forward. What I am against is the *mandatory* part. In my experience, most cases of incompetence stem from poor attitude, lack of motivation and substandard professional pride. Mandatory continuing education does not change these deficiencies.

**KNUD HERMANSEN** is an associate professor at the University of Maine, where he teaches surveying and law. He also provides surveying, engineering and legal services during part of the year.

*Leininger Continued from page 27. . .*

If every surveyor routinely sought out educational opportunities, no requirement would be necessary; unfortunately, that is not the case. The time for mandatory continuing education has come. Many surveyors will see no impact from the requirement. We can only hope that many others will see an impact and the public will gain as a result.

**JOEL LEININGER** serves on the Maryland Board for Professional Land Surveyors and is Associate Editor of the *Professional Surveyors* magazine.

## Hermanson's Rebuttal to Leininger:

Although Joel raises some credible arguments, the arguments miss the two main points. To say surveyors are professionals, able and willing to be a caretaker of the client's trust and property, yet unable to determine their continuing education needs on their own, seems ludicrous. A costly development in which numerous future lot owners will make the biggest investment of their lives is entrusted to the surveyor, yet he argues the same surveyor is unable to determine what his or her needs are in continuing education.

Studies show that without examination, continuing education must be voluntary and not mandated to be effective. Would the 14-year-old boy mentioned in Joel's argument learn in a high school where he simply had to attend and did not have to pass any examinations? Many advocates of mandatory continuing education would switch sides if exams were required.

Continuing education is an individual's responsibility. If a surveyor is disciplined by the Board of Licensure and has not endeavored to continue his or her education voluntarily, he or she should have to take and pass the surveyor's examination within two years to continue to practice the profession. We should not mandate the needs of the majority for the deficiencies of a minority.

## Leininger's Rebuttal to Hermansen:

Now, I'm not one to quibble (usually), but some of the studies by educational theorists leave me unconvinced. Weren't they the ones responsible for reinventing K-12 education to the effect that most recent high school graduates don't know what a quadrilateral is? To cannibalize an old saw, education is too important to be left in the hands of educators. Intuitively we know that some things are beneficial despite occasional assertions to the contrary. Even the surveyors against mandating the practice agree that continuing education is important. We can't have it both ways, folks. It is illogical to argue that because some will sleep through sessions, sessions should be voluntary. Some violate drunk driving laws. Should they, too, be voluntary?

As members of society, we agree to abide by the precepts imposed for the good of all. Few of us gladly pay taxes, but we all demand good roads. There is a price for civilization and a price for most of its components. The cost of the privilege of offering professional surveying services to the public is licensure, and with that comes all of the obligations imposed by society. The ultimate question is, are we willing to do what is necessary to render proficient service?

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# Obituaries

## Edward Frank Kulhan

A small earthquake rumbled through Fresno, California on Saturday morning May 15, 1999. It was a fitting tribute to the man who pioneered the educational reshaping of an entire profession. Edward Frank Kulhan was laid to rest on Friday May 14 in Wheatland, California.



Edward Frank Kulhan was born in Vienna Austria on March 31, 1915, during the First World War.

Ed grew up in Los Angeles. He graduated from Lincoln High School on February 3, 1933. He immediately enrolled at Los Angeles Junior College. He finished his studies there on June 21, 1935. Then he transferred to the University of Nevada, Reno. Ed wrestled and was the catcher on the baseball team. He earned his Engineering degree in December 21, 1939.

He enlisted in the Army on October 14, 1941, and was sent to Officer Candidate school. Ed met his future wife during this time. He proposed to Lois on December 7, 1941. Six months later they were married. Their first daughter, Rozanne, was born on March third, 1944 at Camp McCoy, Wisconsin, during a Blizzard. Commissioned as a Second Lieutenant in the Engineering Corps, Ed promoted rapidly and later saw action in Europe with the 655th Engineer Topographic Battalion.

Ed next took a position with the Army Map Service in Central America. Based in Guatemala, he headed up a major mapping effort in a ten country region for four years.

Ed next went to Penn State to study surveying for a masters degree. Ed received his Master of Science degree in Engineering in 1953. He stayed on to teach for a few years.

Ed was hired at Fresno State College in the Fall of 1956 to teach surveying. By the Spring of 1958, he started the first surveying conference in California.

Another indication of Ed Kulhans' resolve was witnessed at the 1971 Surveying Teachers Conference held in Corvallis, Oregon at Oregon State University. It is worth noting at this point that a resolution was passed at the 1968 Penn State Surveying Teachers Conference stating that developing four year degree programs in surveying would be a good idea. Finally Ed Kulhan couldn't stand it any more, he stood up and said, "I'm tired of all the complaining, I know how to solve these problems. To prove it I've already started a four year program in surveying, and already have two graduates". Many participants allegedly responded "You can't do that, it won't work". But Ed replied, "Just watch me". At that precise moment, the foresight and determination of a little known man from Fresno, California was

revealed. That first program in 1971 has been followed by nearly 25 others in less than 30 years.

Ed retired in the Spring of 1978 but stayed on, teaching part time through the accreditation visit in the Fall of 1979.

Ed and Lois moved to Wheatland, California in 1980. They bought some land there near the foothills east of town, and raised horses. Lois passed away on November 28, 1986. They had been married 44 years. Ed continued to live in Wheatland with his daughters Rozanne and Suzanne. Rozanne and Ed made it back to two conferences in 1986 and 1996.

Ed fell and broke a hip in January of 1999. Misdiagnosed at the hospital, he was not treated adequately for several weeks. He made a miraculous recovery on his birthday, March 31, but soon, a host of viral infections began to take their toll. Ed finally passed away on May 5, 1999. The memorial service was held at 10:00 am May 14, 1999 at the St. Daniel's Catholic Church in Wheatland, Father Julian Medina presiding. The service was attended by Rozanne, Suzanne and her husband Brian Amsbaugh and their three children Courtney (11) Christopher (9) and Corey (8). Also in attendance were Larry Fenske, Dave Goodman, Dr. Nader, Dr. Crossfield, and several friends from the local area. Nineteen hours later the ground shook in Fresno. It was a fitting tribute!

It would be appropriate to provide three quotations from Edward Frank Kulhan.

On the value of a university education Ed said:

"In the past, there was a lot of self-educators and that's a very hard row to hoe. If a problem comes up, there is no one to get you over the hump except yourself. At the university, it is much easier for the student to get consistent help when he needs it. I in no way imply that academic surveyors have any more smarts than other surveyors - it's only that they have been exposed to certain situations that others have not."

On the origins of the four year degree idea Ed said:

"A lot of people say 'Kulhan did this' or 'Kulhan did that.' Kulhan couldn't have done anything without the profession backing him - it is not a one-man deal! Curt Brown, Chuck Woldridge, John Pedri and many more had the idea of a four year curriculum in 1961 at the San Joaquin Valley Surveyors Conference. It took a lot of convincing that academics was not going to hurt the average surveyor - it would help him."

And finally, on the role of the graduate from a four year degree program, Ed said:

"If there is any advice I can give to a graduate from here, it would be the same advice I've given to graduates in the past: listen, watch, learn and keep your mouth shut until you get your feet on the ground and have some practical experience behind you. After that, don't keep your mouth shut if you know that things are wrong, or the profession will not advance."

And one of Ed's famous axioms:

"It's easier to get forgiveness than it is to get permission".

The passing of Ed Kulhan marks the end of an era. The man who loved to talk, was perhaps our most accomplished man of action. Ed Kulhan, started the nations' first four year surveying program in 1971. His motivation and drive helped insure that this program was the first in the nation to be accredited in 1979. He was awarded the Earle Fennell Award for excellence in Surveying and Mapping Education from the American Congress on Surveying and Mapping.

The surveying, photogrammetry, mapping and Geomatics profession in the United States owes a huge debt of gratitude to the man who single handedly showed everyone else the way to go and how to do it.

Send condolences to Rozanne Cole, 3900 Spenceville Rd., Wheatland, CA 95692. Geomatics Engineering Scholarships will be established in Ed's name and in the name of his mother Mary Ryba. Make contributions out to the CSU, Fresno Foundation. Send anecdotes, remembrances and/or checks (tax deductible) to: James K. Crossfield, Dept. of CGEC, CSU Fresno, Fresno CA 93740-0094.

*Submitted by James K. Crossfield*

## Joel Readio, PLS 4319

Joel Readio, 69, of Carmel Valley passed away on June 3, 1999. Joel had been a member of CLSA since 1973, and a Life Member since 1992. He was an active member and officer of the Monterey Bay Chapter.



Born and raised in Pennsylvania, he graduated from Carnegie Institute of Technology and later did graduate studies at the University of California at Berkeley and Stanford University. His leisure activities included fishing, hiking and skiing. He was a certified instructor for the National Ski Patrol and a dedicated member of the Ski Patrol in the Sierra Nevada for many years. He was also involved in avalanche control.

Joel will be most remembered as the chairman of the Engineering Department at Monterey Peninsula College. From the early '60s, for nearly two decades, he taught surveying and engineering courses. His efforts gave many of us our first real exposure to the profession of land surveying. Joel was a mentor and a personal friend.

After his retirement from teaching, he entered private practice as president of Pacific Land Services, Inc., specializing in land surveying and geotechnical engineering.

A memorial service was held July 10 in Carmel Valley.

*Submitted by Steve C. Wilson*

## Letters to the Editor *Continued from page 11*

ing, every meeting, on a very narrow subject. It can merely be recounting a problem with a survey (almost every job), and the solution applied to the problem. Or a wider scope can be had by spreading it over a number of meetings, which may foster increased attendance. Advertise it in the chapter newsletter far enough in advance, and in enough detail for one to prepare for it. Or the seminar can be more formal. A weekend Bar-B-Q with a 2-3 hour seminar is one method. A moderate charge can pay for local talent to make a presentation, or pay for handouts. Professional organizations should have the resources to respond to a phone call asking for direction to a solution of an immediate problem.

Mandating continuing education is a bad idea. Seminars, which are the backbone of continuing education, cost a lot of money. Once mandated, the business of putting on seminars would become a very lucrative industry, since they could base their charges on knowing they have a mandated audience. Then there's the cost of transportation and lodging, since most are not local. How many will be required each year? Will there be a pass/fail for credit, or can we spend the day sipping martinis? Who will decide the syllabus? Who will ensure adequate numbers of seminars? Who will validate their content? Will there be seminars-by-mail? There are other professions that mandate continuing education by courses given at the work-place by the employer. Will this be a mandate to business? Will the state provide funding?

If you don't study, hoping for an easier or more familiar test it's a crap shoot. If Party Chiefs and licensees don't jump in to help their charges become participants of the profession, they are not only discouraging participation, they are missing out on a tremendous resource of talent for their own benefit. Professional organizations will not expand their membership unless they give prospective members a reason to join, and one definite way is to let members access their vast resources.

*J. Lance Hiller, L.S. 4089*

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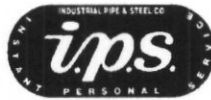
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The goal of the California Land Surveyors Association is to promote and enhance the profession of surveying, to promote the common good and welfare of its members, to promote and maintain the highest possible standards of professional ethics and practice, and to elevate the public's understanding of our profession. CLSA represents all Land Surveyors, whether they are employees or proprietors, whether in public or the private sector.

## Representation

■ **LOCAL:** Your local chapter represents you in local issues. Through your chapter representative to the State Board of Directors, the individual member can direct the course CLSA will take. ■ **STATE:** The Surveyor is represented at the state level through an active legislative program, legislative advocate, and liaison with the State Board of Registration. ■ **REGIONAL:** CLSA is an active member of the Western Federation of Professional Surveyors. This Federation is composed of associations throughout the western United States and addresses regional issues. ■ **NATIONAL:** Through institutional affiliation with the National Society of Professional Surveyors and the American Congress on Surveying and Mapping, CLSA is represented at the national level.

## Education Opportunities

CLSA presents annual conferences which provide technical and business programs, as well as exhibits of the latest in surveying and computing technology. Seminars and workshops are presented to assist in continuing education. CLSA publishes the California Surveyor magazine and the CLSA NEWS to keep the membership abreast of changing legislation, legal opinions, and other items which affect our profession.

## Business and Professional Services

CLSA provides a fully staffed central office which is available to answer questions or to provide up-to-date referrals concerning legislation, educational opportunities, job opportunities, or other issues concerning our membership. Professional liability insurance programs are available to members.

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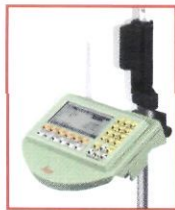
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