

WHERE DOES NSPE STAND ON INDUSTRY EXEMPTIONS?

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This White Paper has been prepared at the request of the Washington Society of Professional Engineers to update the status of the NSPE's Industry Exemption actions over the years and to frame the issue against U.S. Industry as it exists today.

Since the organization of NSPE in 1934 the issue of Industry Exemption from licensing laws has been hotly debated and legislated. In his 1984 book, "Building for Professional Growth" our first and longest serving Executive Director, Paul Robbins summed up the history of the struggles over the Industrial Exemptions.(1) He describes how enactment of licensing laws by state legislatures included strong lobbying by industry and public utilities to exempt their employees from these laws. In many cases these efforts resulted in the inclusion of several types of exemptions in the various state laws. The most common exemptions stated that licensing laws only applied to "engineers responsible for engineering design of products, machines, buildings, structures, processes, or systems used by the public". These words, were to say the least, ambiguous. Interpretations by each State Board were needed to deal with specific cases. Where industry strength was great, State Boards have been "generous" in their interpretation of the exemptions. Our NSPE policies on this issue have seen several revisions as discussed in Paul Robbins book.

In 1948, NSPE adopted a policy urging industry to "engage only registered professional engineers for responsible engineering positions". In the following years several states attempted to remove the industrial exemption from their laws.

In 1964 the National Electrical Manufacturers Association urged their constituent organizations to oppose any attempts to remove the exemptions. The resulting dialogue prompted NSPE to reexamine the 1948 policy and to take the position that "state engineering laws should apply to all structures, processes, or systems used by the public", and that NSPE "opposed proposals to exempt engineers in industry from the state registration laws".

At the July 1971 national meeting the NSPE revised the policy again to "recommend the phasing out of existing industry exemptions in state registration laws".

A 1975 paper prepared by PEI describes the current status and eloquently lays out 12 arguments used to defeat mandatory licensing of engineers in industry.(Appendix A) Some of the arguments are difficult to assuage, but the crux of the matter is we won't do it because industry has the political clout to defeat such legislation in most states. That paper ends on an optimistic note of hope for the future, but no significant ground swell has risen to eliminate these exemptions.(2)

In 1976, the policy was revised by adding that "engineering as a whole cannot obtain its rightful place in the hierarchy of professions until it is defined and recognized on a legal

basis". A position paper explaining the history and status of NSPE's policy on the Industry Exemption was issued in 1977.

The NSPE Board reversed the existing policy on Industry Exemptions in 1979 because of discussions with industry flowing from the Industry Advisory Group. A new policy titled, "Promotion of Registration" was created and the previous statements opposing the exemption of engineers in industry were removed. A paragraph was added defining what was meant by responsible charge, as used in most registration laws. This change led to a continuing dialogue with those forward thinking industry leaders who make up the outside participants of the Industry Advisory Group. The philosophy supported by NSPE and PEI was that we could make more progress by employing a cooperative approach with industry. There has been some success with some industrial firms in promoting licensing among their employees, but only a few of the many thousands of industry leaders are represented in the Industry Advisory Group. Some companies are paying for the test preparation, granting automatic pay raises upon licensing, requiring licensing for promotion to positions of responsible charge, posting licensed engineers names in their lobbies and providing other effective encouragement. Unfortunately whole segments of industry remain adamantly opposed to any weakening of industry exemptions.

Since the publication of Paul Robbins book in 1984 the discussion has continued, but our NSPE policy remains as established in 1979.

There are a number of states that did not specifically include the industry exemption in their licensing laws, and some that have modified or removed exemptions over the years. In 1994 seventeen states replied to an NSPE query stating they had no industry exemption in their licensing law: Alabama, Arizona, Hawaii, Idaho, Indiana, Maine, Mississippi, Montana, Nevada, New Hampshire, New Jersey, New Mexico, Oklahoma, Rhode Island, South Carolina, Utah, and Wyoming. (NSPE State Bulletin, July 1994) However, many of these states' laws did contain an exemption for "employees or subordinates" of persons holding a PE license, and Arizona and Rhode Island had a manufacturing exemption.

While he was NCEES President in 1992-1993, Paul Taylor, P.E. strongly promoted state actions to eliminate or minimize industry exemptions. While his arguments were cogent, no ground swell of exemption removals resulted.(3)

During the 1990's Colorado engineers banded together to try to persuade the legislature to repeal the exemption for local government employees. The PEC, ASME, CEC and other engineering associations worked together placing a high priority on this issue. They made good progress through the system until the Colorado Municipal League and Colorado Counties, Inc. mobilized their lobby opposition. Efforts to hammer out some compromise concessions were not productive, and the exemptions were not removed.

In 1994 Idaho changed its law to insert an exemption for industrial employees. The wording in this change provided the exemption for "the practice of engineering by

employees of a corporation or company as long as the services provided by them are for internal corporate or company use only”. Both the Idaho BORPE and the ISPE opposed this change when introduced and the opposition heated up when the proposal was further amended to also include an exemption for any individual preparing and reviewing any plans and specifications. When this feature was dropped, the Idaho BORPE agreed not to oppose the industry exemption but the ISPE continued its opposition to the insertion of the industry exemption and lost that battle.

Also in 1994, the Tennessee legislature adopted legislation that “explicitly exempts engineers, architects, and landscape architects who are employed by a municipal electric system or an electric and community service cooperative” from their licensing act. The exemption was to apply “only if the services they provide pertain solely to the operations of their employer and if they do not offer services to the general public for additional compensation”. This Tennessee legislation also added exemptions for “public works construction, reconstruction, or renovation of electric distribution systems owned or operated directly or through a board by a municipality, county, power district, or other state subdivision”. The power of the state’s municipal electric cooperatives overwhelmed the opposition of our TSPE members. The TSPE did succeed in an amendment to “specifically prohibit co-op employees from publicly calling themselves engineers unless they are licensed PE’s”.

One of our NSPE members, Bill Medcalf, Jr., P.E. who also happened to be the president of Applied Kinetics Corporation wrote a viewpoint piece for the Engineering Times in 1995 strongly laying out the need to license engineers in industry.(7) He stressed the radically changed world of product and process development today where consumer and durable goods are more sophisticated, complex, and potentially hazardous to the public than the products of 50 years ago. In addition the rate of technological growth has been such that today/s senior engineers rapidly become obsolete without continuous education. Quoting Bill, “to continue with industry exemption breaches the avowed purpose of engineering licensure laws—reducing risk to the public.” Recognizing that licensure cannot guarantee that engineers will always act with public safety first in their minds, the individual engineer’s integrity and avowal of the ethical concepts of licensing can provide an important extra protection to the public beyond the technical competency of the individual. The continuing education of the Professional Engineer must become part of the professional commitment.

In 2003 the Florida Engineering Society, one of our most powerful state societies tried to tighten up on the titles of Engineer, Civil Engineer etc. by restricting the designation to P.E.’s. It got introduced into legislation before the aerospace industry and entertainment lobby became aware of the proposal. At their request, the Governor included the issue in a special session of the legislature, called for another purpose. The aerospace industry got an exemption that allows them to call any employee an engineer, regardless of their qualifications. The industry exemption that was negotiated provided that to be called an engineer, an employee must have at least a four-year degree from an approved university.

Ken Rigsbee told me recently of the 2003 effort by the Texas Society of Professional Engineers to protect the tight industrial exemption in Texas. Here again the industry lobbies arguing economic development via contracted cheaper foreign engineering were able to stop any action in spite of the very expert capabilities of the TSPE legislative representatives.(10)

Today, our industry is moving to shorter product and process development cycles. The technical input from the engineer must be made with a continuous reflection of the public and environmental safety risks possible with the product or process. It is not enough to depend on the ethical conscience of the industrial owner to hold back the product until all unknowns are resolved. The Professional Engineer must be accepted as an important decision maker on implementation of new technology. The financial and sales management team must not overrule engineering concerns with public or environmental safety. This is certainly not the current situation. Several recent incidents involving engineers exempted from licensing have resulted in major U.S. tragedies.

Both the Challenger and Columbia shuttle failures resulted at least in part because engineers' safety concerns were ignored or overridden by management. In the first case the project engineers warnings that the temperature at the launch time was too low for the flexible O ring to properly seal were overridden by management. If a requirement for licensing of engineers in responsible charge would not have prevented the bad management decision, it would certainly have been a much stronger factor urging management to listen to the warnings. That particular error will not be made again, but how many other cases occur daily where warnings are ignored and luckily failure does not occur. We don't need to subject our citizens to those kinds of unnecessary risks.

In the Columbia failure, there were warnings that insulation pieces had come loose previously, but in the failure case a large piece was thought to have struck the wing. Engineers on the staff alerted management to the potential that damage had occurred and urged an inspection of the wing in orbit. Repeated requests were ignored and the return flight was permitted to occur with no effort to examine the damage to the wing before the return flight.

Another recent case of serious failure in an industry exempted from licensing was the failure of the Davis-Besse Nuclear Reactor Head in Port Clinton, Ohio. In this case the responsible maintenance engineer reported the need to fully examine the cause and effect of major corrosion products on the reactor head during a planned outage. The engineers warnings were ignored and the reactor was run for a full additional power cycle. When the 8 inch thick head was finally examined, it was completely corroded through with only the stainless steel reactor vessel liner containing the 1000 psi steam in the reactor. Failure did not occur, but it was a close call that could have been avoided if the advise of the engineer was heeded. Again, if this engineering position was filled by a licensed professional engineer, would the increased status have changed the management decision. The odds are it would help to protect the public from this type of irresponsible decision.

A large number of NSPE members have continued to attack the industry exemptions or to work cooperatively with industry to encourage the licensing of engineers in responsible charge whose decisions could affect public safety. There are a lot of martyrs among them. The clout of NSPE is slight when arrayed against the collected strength of the industry lobbies. Our official approach since 1979 has been to find cooperative, mutually advantageous ways to support and promote licensing. As seen from the recent state actions providing even more exemptions, we are not succeeding. Where then are the answers.

Many in industry point out the major technological strides of an unfettered industry free to innovate and to use the best minds, engineers or not, licensed or not, for their idea pools. In many cases break-through products are interdisciplinary and could not be tied to engineering disciplines alone. These are strong arguments supported by the superior achievement of U.S. industry in so many fields. How then can we convince industry that their best interests are served by supporting the licensing of engineers in responsible charge and encouraging the licensing of all engineers?

We have traditionally focused our efforts toward the licensing of product designers in industry because the licensing laws have focused on the design professional. Some years ago our concepts of professional practice were expanded to include professional engineers in construction. Maybe it is time to step back and take another look at how the public and environment are most likely to be damaged by industry errors. In the case of product design, industry has the capability to extensively test a product design before implementation. That testing can certainly provide a better safety assurance than the fact the design engineers were licensed.

But what of the operation and maintenance of the products and process plants provided by industry. A nuclear power plant can be maintained and operated in a safe way. Most of them are. But what of the exceptions, such as Davis-Besse? The public risk of incompetent or irresponsible maintenance or operation of complex systems and facilities can be significant. Other examples of complex systems where sloppy maintenance can bring disaster include commercial aircraft, other public transportations systems, and chemical or petroleum processing plants. We have seen deaths from aircraft and rail accidents in recent years that have been directly attributed to improper or missing maintenance.

Many of our members are still very concerned about the inconsistencies of the many exemptions that appear to disregard the legislated purpose of the licensing laws to protect the public. Another active NSPE member, Don Hiatt was 2004-2005 President of NCEES.(11) Don has a long history of service on his state licensing board. He is a strong supporter of public protection through licensing but has been frustrated as we all have by the impediments. Are we only to protect the public from certain risks, and leave others un-addressed? Perhaps it is time to change our educational and political approach to the industry exemption and stress the needs for licensing of engineers in responsible charge of operation or maintenance of complex industrial processes. Perhaps legislators and industry would find more logic in that approach.

References:

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Appendix A (Taken from Reference 2, PEI Paper – 1975)

Why have some firms in industry resisted efforts to remove the industry exemption in the state laws? There are a number of reasons of a practical and philosophical nature advanced:

- 1 “Leave us alone”. Some industry executives argue that they are in the best position to evaluate qualifications and should not be hampered in their operations by being restricted as to personnel choices and assignments on the basis of registration. Perhaps the most realistic answer is that this is the same position industry has taken over the years regarding all control or regulations, from the first state factory safety laws of a hundred years ago to the present Occupational Safety and Health Act. This is not a satisfactory answer if there are valid reasons to insist upon and require registration from the standpoint of protecting the public health and safety.
- 2 “We are responsible and liable”. There is no question that industry will be called upon to pay for its mistakes if the public is injured by the unsafe design of a product. Being required to pay in dollars for injury or damage is not sufficient; the attempt would be to avoid the poor design causing the injury.
- 3 “Registration is no assurance of competence.” This is true to the same extent that licensing is not an absolute assurance of competence by a medical doctor and no assurance that mistakes will not be made. It is only an assurance that the individuals involved have met the minimum standards of competence as determined by a public agency on behalf of the public.
- 4 “Engineering is too varied and broad to rely on registration for competence”. The argument is validly made that nothing is proved or gained if an engineer qualified by education and experience in civil engineering is involved as an industrial employee in the design of motors. True. But the answer is that a registration requirement would not impose on industry its choice as to assignments of particular engineers. Engineering registration is generally on a broad basis as professional engineer, without branch designation. It would remain with the employer to determine the particular area of specialized practice to be assigned to each engineering employee. An Industrial employer would not assign a member of its legal staff with background and experience only in tax law to handle a patent assignment transaction.
- 5 “It is impractical to require that a registered engineer design every product.” True. One of the first problems in framing the wording of the law to apply to industry is to not only remove the industry exemption language, but to add affirmative definitional language to clarify and specify to what extent the law applies to the design of products. This has been done in the NCEE Model Law by proposing to add to the definition of “practice of engineering” the additional words: “...and industrial or consumer products or equipment of a mechanical, electrical, hydraulic, pneumatic, or thermal nature, insofar as they involve safeguarding life, health or property...”

Appendix A (cont.)

- 6 “How would industry be expected to interpret that language?” As a practical matter, industry’s reasonable interpretation would be self-evident in the case of most products, but in case of doubt the state registration board would ultimately have to make the interpretation, subject to review by the courts on a claim that the interpretation was arbitrary or capricious.
- 7 “Many products to which the definition would apply are complex and consist of hundreds or thousands of components.” This is admittedly a problem area and would require different registered engineers for the various major components in their areas of technical expertise; e.g., the same registered engineer in responsible charge of the design of the braking system would not be expected to be the responsible engineer for the power system.
- 8 “It is unrealistic to require that every employee in the design process be registered.” True. The registration laws have always and presently recognize that only the person in “responsible charge” is required to be registered. A uniform and recognized exemption exists for subordinates on the basis that their technical work “not include final engineering designs or decisions and is done under the direct supervision of and verified by a person holding a certificate of registration”. (Sec 23 (c), NCEE Model Law.)
- 9 “‘Responsible charge’ is too broad a concept as applied to complex industry operations.” The NCEE Model Law definition—“direct control and personal supervision of engineering”—may be too broad. The state law definition can be revised along a more acceptable line to industry as applying to “the person or persons who determines technical questions of design and policy, superintends the work of subordinates, and, in general, the person whose professional skill and judgment are embodied in the plans, designs, and advice involved in the work.” (Taken from rules and regulations of the Minnesota State Board of Registration for Architects, Engineers and Land Surveyors, Sec. 15)
- 10 “What state law would apply to multi-state industrial operations?” It is recognized that there are complex products with many engineered components in which major components may be designed in different states, assembled in still other states, and sold in still other states. Hopefully, however, the state registration boards by regulations and common sense interpretations would accept the registration of the responsible engineer in each aspect of those elements of the total project requiring that a registered engineer be in responsible charge of that part of the total operation. If considered necessary, this aspect could be written into the registration law. The NCEE Model Law recognized this principle with regard to the section authorizing corporate practice by its stipulation that the corporate officers who are required to be registered may be registered under the law of the state in which the certificate of authorization to practice is sought or under the registration law of any other state.

Appendix A (cont.)

- 11 “In multi-state industrial operations it is often necessary for engineers to move and work freely in many states.” This concern can be overcome in several ways. Once registered by written examinations in any state, the boards in other states are authorized to and do in fact grant registration by reciprocity (without further examination). This procedure has been particularly enhanced in recent years as the state boards are using the NCEE uniform examination procedures. For those not registered by written examination (the number of which will decrease in the years ahead) all of the state laws permit the issuance of a temporary permit for practice in other states. There may be a problem for those permanently transferred to another state and whose practice will extend beyond the temporary permit period. But this problem will solve itself as registration by written examination becomes the norm.
- 12 “What about present engineering employees who are not qualified for registration or are past the point of being willing to or capable of passing a registration examination?” this point poses difficult and valid concern. For engineers in those categories (bearing in mind that the registration requirement would apply only to those in responsible charge) it has been proposed in at least one state that the amendments to the law to prescribe its application to industry also provide for an exemption for all current employees designated as engineers by the company so long as those employees remain in that company and a “grandfather” clause to permit the registration of all current engineering employees determined by the registration board to meet the engineering education and experience requirements, but not without some examination. Some registered engineers have objected to the new “grandfather” proposal as being too lenient by opening the door to those with questionable qualifications. However, this point might be concluded on a state-by-state basis: the proponents of mandatory registration for engineers in industry have no intention or desire to cause the termination of employment of non-registered engineering employees whose work is acceptable to the employers.