

# American Engineer™

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## ...And Business for All

By Richard F. Tax Vice President  
American Engineering Association Inc.

*We believe a company consists of management, its workers, its shareholders, and customers. A key to the success of a company is that those four elements should equally enjoy the maximum benefit.*

Konosuke Matsushita

This above quotation relates the philosophy of Mr. Konosuke Matsushita. He was the founder of Matsushita Electric Industrial Company (the company that manufactures products under the names of Panasonic, Technics and Quasar to name a few). The General Electric VCR in my home was made in Japan by the Matsushita Company.

Here is an example of one of the most successful design, development and manufacturing companies in the world and the founder's philosophy dictates that management, its workers, shareholders and customers should all enjoy the maximum benefits. It's inspiring to be able to quote such a successful man who sets a fine example as a team and industry leader.

I have always thought of the corporate structure as an environment providing many individuals, having a variety of backgrounds and responsibilities, with the opportunity to work together for the productivity and benefit of all. Perhaps we should stress Matsushita's philosophy more often to make it function.

There appears to be a new corporate atmosphere in the U.S. that pits the CEOs, MBAs and top management against the engineers, programmers and workers that Matsushita mentions. Some people just want more for less and can never be satisfied. Is it survival, greed or just opportunity that encourages a businessman to raid a company or to pick one's pension pocket or lay people off just prior to vesting or treat co-workers poorly and without respect?

Meanwhile, the engineers, programmers and workers usually get better treatment when demand and utilization are high. During periods of high engineering manpower demand we cultivate better managers and companies since the poor managers lose engineers as their engineers seek the better companies, skill enhancement opportunities and an improved work environment. It

isn't long before top management isolates and replaces the managers that can't keep their staff and improvements do result. During low demand periods, we must work for shoddy managers and bean counters that exist only because we have a manpower surplus. Is it possible that engineering manpower supply and demand can also affect the corporate climate?

As engineers, our problems increase with High Tech recessions, lay-offs and low demand. In 1986, Congress told us cuts would be coming due to the military budget reduction. Down sizing and the completion of engineering intensive programs resulted in the displacement of many more engineers and deprived them of employment and, most important, opportunities to increase and broaden their engineering skills. This also has a detrimental effect on U.S. Engineering Capabilities.

Our House of Representatives plays a major role in the Engineering Manpower Balance and with that role the ability to influence the corporate climate, work environment and productivity. We should remember that the worker, technician, programmer and engineer should also enjoy the benefits with management, the shareholder and the customer. Perhaps industry leaders with Mr. Konosuke Matsushita's philosophy could improve the corporate climate. However, I believe we need wiser representatives in Congress who are concerned about engineering utilization and U.S. engineering capabilities to set the foundation for this corporate atmosphere to flourish.

The AEA and members of the engineering community will have to undertake the task of informing and educating our representatives so they may strive for a Manpower Balance and full utilization of our engineers and technical workforce. This is the first step in making Konosuke Matsushita's philosophy, once again, become a reality

## Implications of Offshore Outsourcing – Part I

By Dr. Ron Hira, P.E.

Assistant Professor of Public Policy - Rochester Institute of Technology

- Part I – 1. Synopsis  
2. A Quick Review of the Rise of Offshore Outsourcing as an Issue

**Please Note: The views expressed here are entirely those of Dr. Ron Hira and do NOT represent RIT's or IEEE-USA's official viewpoints.** This article is a set of rough informal observations on some of the characteristics and potential impacts of offshore outsourcing and offshoring on the U.S. It also proposes some potential policy responses.

**THE AMERICAN  
ENGINEERING  
ASSOCIATION**

4116 S. Carrier Pkwy  
Suites 280-809,  
Grand Prairie, Texas  
75052  
817-656-2324

www.aea.org

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*Editor of American Engineer*

Editor@aea.org

**ROBERT A. RIVERS**

*Director of Manpower*

Rrivers297@aol.com

1. Synopsis

There's a growing debate among technology companies, workers, economists and policymakers as to whether the movement of high-skill jobs overseas is good or bad for America.

A number of self-serving studies by companies such as McKinsey declare that offshore outsourcing is a 'win-win' for both the U.S. and the countries gaining those jobs. These studies do not acknowledge that there are many uncertainties in any economic change. It's quite likely that the world economy will be a winner, as other nations enjoy increased access to U.S. investment, markets and technology. But will the U.S. be better off? We really don't know, and anyone who provides a definitive answer one way or the other is practicing fortune telling.

What we do know is that there will be winners and losers in the U.S. Many American workers and organizations will suffer. We also know that large U.S. companies believe that it is within their interest and they will benefit by moving work overseas and will lobby for the unfettered ability to do so. They have already begun to label any idea that they disagree with as 'protectionist', a term with such negative political connotations that potentially useful solutions are forced off the table before they can even be considered.

The real question is not whether offshore outsourcing is good or bad, because it is already happening and will continue to accelerate, but how we find effective ways to mitigate its significant negative impacts. In this vein, I suggest that the government take the following actions.

1. The government must begin regularly tracking the volume and nature of jobs moving offshore. The lack of objective data distracts us from the real issue of solving the problems created by offshore

outsourcing.

2. Congress should reform the temporary visa programs for high-skilled guest workers. They have been misused by many to import cheap labor and accelerate the pace of offshore outsourcing. It is difficult enough for American technology workers to compete with low cost labor from halfway around the world; it is unreasonable to expect them to compete with low cost guest workers here because of visa regulation loopholes. Certain types of work, because of its nature, must be done in the U.S., and it is reasonable to expect that this work should be done by American workers. Instead, we have a guest-worker policy that displaces American workers in favor of foreigners for work that cannot be done overseas.

Of the bills pending in Congress that would reform the H-1B and L-1 visa rules, the Dodd/Johnson bill seems to be the most sensible because it adds safeguards for U.S. workers without reducing the benefits the programs provide to America's technological competitiveness. Similarly, fundamental changes in U.S. immigration law, such as restricting Congress' ability to improve the H-1B and L-1 programs, should not be made by trade negotiators. The recently approved Chile and Singapore Free Trade Agreements severely limit Congress' ability to add safeguards for American workers to the visa programs.

3. Congress should rethink how U.S. workforce assistance programs can best help displaced high-tech workers become productive again. That is no easy task. What exactly will you retrain people to do? Will it be a set of skills that doesn't quickly diffuse overseas? Who will pay for resources required to do this? IBM's CEO and other proponents of education and retraining as the answer for displaced workers are vastly underestimating the cost and difficulty in retraining. Nevertheless, we need to begin the experiments immediately.

4. The U.S. needs a coordinated national strategy designed to sustain its technological leadership and promote job creation in response to the concerted strategies being used by other countries to attract U.S. industries and jobs.

We can learn many lessons from the policies implemented in response to the decline of U.S. manufacturing beginning in the 1980s. For instance, it will take time, creativity, and a collective will to generate good policy responses. However, a key difference makes the search for solutions more difficult: workers alone are being adversely impacted whereas in the 1980s both companies and workers lost. Advocates of offshore outsourcing must ensure (not just assume) that we do not have a great deal of idle human capital in the U.S. It is not sufficient to call their displacement 'painful' and hope for rosy redeployment scenarios. We should set aside the labels and begin to work constructively together to address the real losses - human, economic and innovation - that America will experience from it. If this is done sensibly it will make offshore outsourcing an actual, rather than hoped for, 'win-win'.

2. A Quick Review of the Rise of Offshore Outsourcing as an Issue

In November 2002, John McCarthy, an analyst for Forrester Research, Inc., predicted that 3.3 million white-collar jobs would move from the U.S. to developing countries. Picking up on this prediction, Pete Engardio and his staff at Business Week prepared a cover story for the February 3<sup>rd</sup>, 2003 edition with the ominous title, Is Your Job Next? The subtitle was, "A new round of Globalization is sending upscale jobs offshore. They include chip design, engineering, basic research - even financial analysis. Can America lose these jobs and still prosper?" This was and still is the appropriate question to ask and try to answer.

Three weeks following this cover story syndicated columnist and former Reagan Treasury official, Paul Craig Roberts, wrote a column called, "Lethal Outsourcing", in which he characterized the offshoring trend described in the Business Week article as potentially lethal to the U.S.

After that, things were relatively quiet in terms of coverage of the issue. In fact, in March 2003, I went to Bangalore, India to present a paper on India's Information Technology (IT) industry. There were a number of businesspeople there that were confident that they would begin to capture further white-collar services work, but I must admit that I was skeptical. I felt that there were limits on the amount of work that could be done offshore effectively and efficiently. Also, the job market in India in March 2003 was lukewarm at best. Engineers from the top universities were getting placed, but pull and connections were still a large part of the process.

By June 2003, there were an increasing number of news stories appearing in the Indian press (thanks to the internet they were easily accessible) of companies expanding operations in India. What surprised me most was that it was no longer niche players such as IGate or the India IT firms like Infosys, but now the major U.S. IT companies like EDS and Texas Instruments (TI). New announcements appeared almost daily and the numbers were beginning to add up. Planned additions of 2,000 positions and/or plans to double staffs in India were quite common. My cousins in India confirmed that the IT job market had changed markedly between March and June – in their words, it was in a "frenzy". There were two things about these trends that startled me. First, these were major U.S. multinational companies and they were new to using India a source of labor. While General Electric had been doing this for some time and TI had some operations in Bangalore, this was a very new thing for EDS. Second, these same companies were holding employment flat in the U.S. and in many cases laying people off in the U.S. Another interesting element to this story was that the U.S. press was not reporting any of these developments.

During this same time, U.S. electrical and electronics engineers (EEs) and computer scientists were facing the worst job market ever recorded by IEEE-USA. Unemployment for EEs was at unprecedented heights and at nearly every local IEEE section the first topic of conversation was jobs and job security.

On June 11<sup>th</sup>, 2003, I had the opportunity to present some of these ideas to the Council on Competitiveness' Breakfast Bytes meeting sponsored by the Sloan Foundation. The following week, under the leadership of Chairman Manzullo (R-IL), the House Small Business Committee held a hearing on the issue at which I testified. After that hearing, the U.S. press began to take notice of the issue and some of its implications.

And as more announcements came, the American press began to report the story in increasing intensity. Andy Grove's, founder of Intel, comments at a Business Software Alliance meeting brought even more attention to the issue, spurring another hearing by the House Small Business Committee. Today it has reached what seems to be a fevered pitch. Interestingly enough, the issue is not unique to the U.S. The U.K. and Australia are also grappling with offshoring of jobs and even Singapore is devising strategies to move up the value chain as more of its staple work moves to lower cost centers.

### 2.1 Some Definitions

Before I go any further, I'd like to clear up some confusion in terminology.

*Outsourcing* is simply a customer deciding that they no longer want to make part of their product or process in-house, but would prefer to purchase it from some other organization. This is also known as a

classic 'make or buy' decision, something that everybody does everyday such as whether we would like to clean our own house or outsource it to a maid service. In the IT services industry, it is an important term because many large companies decided over the past decade that they no longer wanted to manage their own internal Information Systems department and instead outsourced the whole function to an IT services firm. An example of this is when Procter & Gamble decided to outsource its IT function to Hewlett Packard in a contract worth about \$3 billion.

*Offshore Outsourcing* is where companies service their customers from overseas locations. Some companies in this business include, Cognizant, Infosys, IGate. On the other hand, *Offshoring* is the practice of a single multinational moving work from its domestic sites to locations overseas – the prominent case in the past few weeks is IBM, which plans on moving nearly 5,000 of its programming positions to India and China.

There are also many additional combinations with interesting modifiers, like Best Shore, Near Shore and Blended Sourcing.

Lastly, there are companies engaged in *on-site offshore outsourcing*, such as Tata, Wipro, Infosys and Satyam. In this case, companies bring in lower cost foreign labor on guest-worker visas such as the H-1B or L-1 to do work on-site in the U.S. An example of this is what Tata Consultancy Services (TCS) proposed to do with a \$15 million State of Indiana IT contract, which was subsequently canceled. TCS planned to bring approximately 65 guest-worker programmers to service that contract. According to TCS, those workers would be paid approximately \$36,000 per year, which is significantly below the starting salary of a graduating computer science major. These distinctions are important because they may lead to very different policy prescriptions.

Additionally, in the language game, observers need to be on the look out for new code words, like *rebalancing* the workforce. Many of the companies now engaged in 'offshoring' have been using this euphemism to represent the shift of its labor force from America to overseas locations. This is akin to the euphemisms of the early 1990's like re-engineering and rightsizing used in place of downsizing.

Within the offshoring jargon, there are a few other terms that are important to note. *Business Process Outsourcing (BPO)* is a set of basic business services that are outsourced or offshore outsourced. These business services can be any basic back office operation from accounting and tax preparation to insurance claims processing. BPO is sometimes called, *IT Enabled Services (ITES)*, in India.

### 2.2 Why Do Companies Utilize Offshore Labor?

Improvements in telecommunications technologies, such as the Internet and lower long distance costs, have all facilitated or enabled the ability of firms to work with remote locations. The larger trend of Globalization has also provided the right kind of environment for this process. There are a number of other elements that have contributed to the increase in offshoring.

First and foremost is cost. High-skill educated labor is far cheaper in many developing countries than in the U.S. The labor cost savings can be as high as a factor of 90%, but when one counts the additional burdens of management and other costs the net advantage is probably closer to 30% or so. Why is high-skill labor so much cheaper in other countries? Part of the reason has to do with excess labor in those countries, but one of the more important reasons is that the workers can afford to be paid less. The cost of living for them is significantly lower.

Salary Requirements for Equally Well-Off Engineers		
Country	PPP	Salary
U.S.	1.0 * \$70k	\$70,000
Hungary	0.367 * \$70k	\$25,690
China	0.216 * \$70k	\$15,120
Russia	0.206 * \$70k	\$14,420
India	0.194 * \$70k	\$13,580

The table above shows the salaries for equally well-off workers in various countries. The factor, PPP, being multiplied in the second column is Purchasing Power Parity, a cost of living measure created by economists to show the differences in price that are not captured by currency valuations. So, a Russian engineer earning \$14,420 would live an equally good life as an American engineer with a \$70,000 salary. The PPP numbers in the table are sourced from the World Bank and ICP program.

PPP is only a rough estimate, since not all goods and services are available in each country, but I think there might be an important implication. It makes the prospects of a Russian or Indian living in their country less likely to demand salaries much in excess of what makes them quite well off. In other words, some people speculate that wages for Indian engineers will skyrocket soon, but I think that

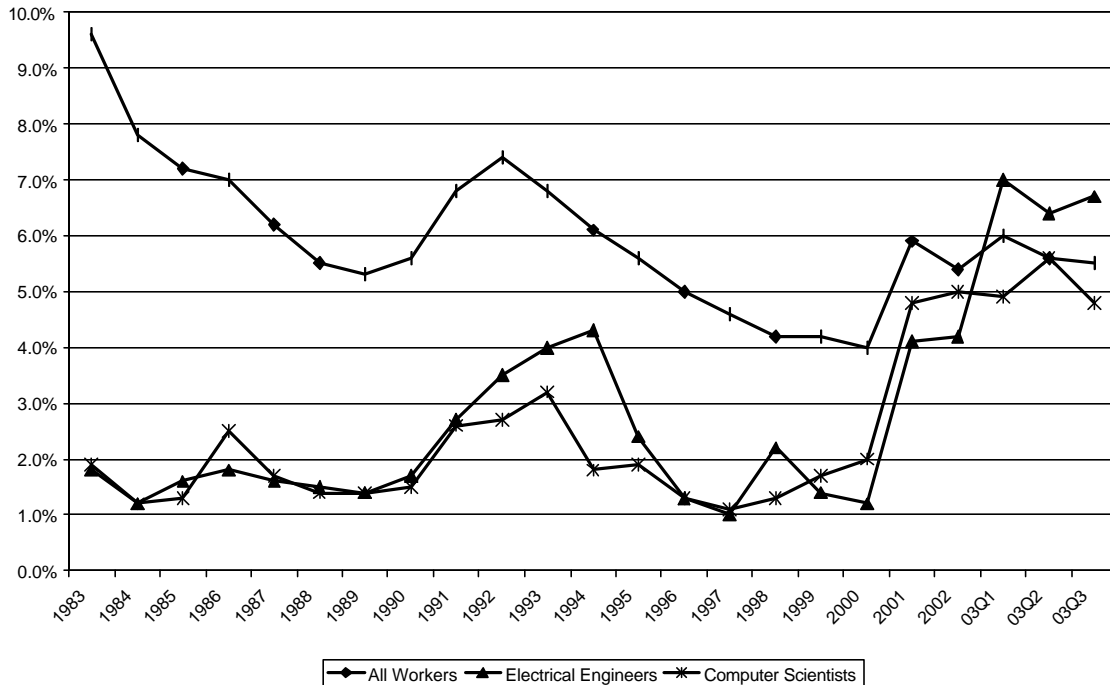
the enormous PPP disparity will act as a governor on those salary demands. It should also be clear that these foreign workers are not being paid their marginal product. Lastly, U.S. engineers cannot afford to compete on price with many of the engineers because they live in a high cost of living country.

In addition to cost, there are other claims about why work is moving offshore. For example, some argue, particularly in industry, that there is a shortage of technically trained U.S. workers. I am skeptical about this line of reasoning for two reasons. First, enrollments in engineering, computer science and information technology are up significantly in the past few years. Second, the following table showing the third quarter unemployment statistics for technology workers which shows that there is abundance of technology workers in the U.S.

Third Quarter, 2003, Unemployment Rates for IT Occupations		
<u>Occupation</u>	<u>Workers (000's)</u>	<u>Unemployment Rate (%)</u>
<u>All Managers</u>	14,815	2.9
Computer & Information Systems Mgrs	375	5.5
Engineering Managers	79	8.0
<u>All Computer Occupations</u>	3,047	6.0
Computer Scientists & Systems Analyst	748	4.8
Computer Software Engineers	802	4.6
Computer Programmers	598	7.1
Computer Support Specialists	334	7.3
Network & Computer Systems Admin	141	7.6
Network Systems & Data Comm Analyst	424	5.0
Computer Hardware Engineers	135	6.9
Electrical & Electronics Engineers	374	6.7

To put a more historical perspective on it, below are the unemployment rates for the civilian population, electrical engineers and computer scientists for the past 20 years.

### Unemployment Rates for Selected Occupations: 1983 - Present



As you can clearly see, the rates for EEs and CS workers have jumped rather dramatically relative to general downward trend for all civilian workers. In the 30 plus years that the Department of Labor has been collecting statistics, the past two years are the first in which unemployment rates for electrical, electronics and computer engineers are higher than the unemployment rate for all workers. For comparison purposes, the unemployment rate for electrical engineers was 1.2% in 2000, less than one-fifth its current level. And throughout the 1980s, at a time when unemployment rates for all workers got as high as 9.5%, electrical and electronics engineering unemployment rates never rose above 2%. This employment situation is not just because of the ‘dot-com bust’ or ‘telecom meltdown’, this is a structural change in the labor market. There are many engineers who were gainfully employed long before the dot-com boom/bubble who cannot find work now.

Everyone agrees that investments in education are important to all segments of society in order to improve technical literacy and enhance skills. But it should be noted that increased education spending to expand the pool of highly skilled U.S. scientists and engineers would fail if there are not rewarding and reasonably secure career opportunities in those fields upon graduation. In that regard, I would point to the observations of noted demographer Dr. Michael Teitelbaum in a recent article (Do We Need More Scientists?) for *The Public Interest* (No. 153, Fall 2003):

Instead of raising the false flag of shortages, those concerned about the future of science and engineering in the United States should

**In the next newsletter issue:**

- Part II – 3. What Are the Likely Impacts of Offshore Outsourcing and Offshoring?
- 4. What Types of Jobs and How Many Are Moving Offshore?
- 5. A Potpourri of Proposed Policy Solutions
- 6. How to Move Forward

encourage objective appraisals of current career paths, as well as innovations in higher and continuing education designed for more agile adjustments to inevitable changes in these dynamic fields. The overarching goal should be to find ways to make these careers attractive relative to the alternatives, for this is the only sustainable way to ensure a supply commensurate with the United States’ science and engineering needs.

Companies also choose to move work offshore because of the industrial policy strategies by foreign governments. For example, Russia agreed to purchase Boeing planes only if it located some of its design engineering in Russia. China also seems to be quite good at ensuring technology transfer in its deals. On the carrot side of the carrot-stick equation, some countries are involved in active smokestack chasing, where they provide tax holidays for targeted industries and exports. The Indian IT is a case in point.

Other reasons cited for moving offshore include the ability to take advantage of time zone differences and provide 24/7 production capability.

But the most important reason why companies are moving work offshore is that the managers are now aware of it as a possibility, and more importantly perceive it as something they must do because their peers are. The practice is becoming institutionalized at so many companies. A new job title - “Global Supply Coordinator” – has even been created to describe a new cadre of managers who are responsible for figuring out how best to move work to overseas locations and how best to manage it when it gets there.

# AEA Newsletter Additional Feature: Letters to the Editor

By L. Durfee

My name is Lawrence F. Durfee (LarryD for short) and I am the new editor for the AEA Quarterly newsletter. My Engineering career spans over 30 years of experience in a wide variety of different fields and I am now very much interested in advancing the professional aspects as well as the technical aspects of the profession. I volunteered for the editor position so that I could give something back to the Engineering community that has served me so well in the past.

Until now, the newsletter was mostly a way to inform the AEA membership of our activities, but now I would like to extend an invitation to all members to send comments to the organization. I will attempt to read all the E-Mail that is sent, reply to some and publish the best ones (all constrained by a limited amount of time by me and space in the newsletter). So, feel free to send your comments

to [Editor@aea.org](mailto:Editor@aea.org) so that everyone can feel the pulse of the Engineering community on professional issues. The kinds of comments we are soliciting would be comments about your job satisfaction, job security, how you think AEA is performing, comments about proposed legislation, the offshoring phenomenon, and so on. Essentially, we are interested in comments about the professional aspects of Engineering.

Send us your thoughts: [Editor@AEA.org](mailto:Editor@AEA.org)

Sincerely,  
LarryD  
[Editor@aea.org](mailto:Editor@aea.org)

## Announcements by Our AEA President Bill Reed

### Newsletter

Starting in January, AEA will become a "virtual" organization. That means our newsletter will be delivered electronically [*Editors note: this has been delayed until the next newsletter*]. If you do not have Internet service, we will not be able to deliver information to you. (There are a few free Internet connections, but you will have to put up with popup ads).

For those who do not want to clutter up their private e-mail with AEA information, we can provide a no cost e-mail address in the form of [username@aea.org](mailto:username@aea.org). Back issues of the Newsletter may be available on line, but that has not been determined yet. We need each of you to be able to be contacted by e-mail. We cannot wait to send you a letter or wait for the next newsletter to come out to urge you to contact your elected officials.

There are two reasons for this action; first, this will reduce our expenses leaving more of our assets to put towards solving the oversupply problems. (Outsourcing, H-1b, L-1 etc.) Second, it will show us who are interested in contacting your Representative and Senators about these problems. Without your participation, we will get nowhere.

### Address Change

Our mailing address is changing. The P.O. box in Ft. Worth will be good until the end of January 2005. The new address is 4116 S. Carrier Pkwy, Suite 280-809, Grand Prairie, TX 75052. Both will be good until the Ft. Worth box fades out in January 2005. After that, only the Grand Prairie address will be good.

Again, there two reasons. It is more cost effective and we will not have to drive nearly as far to pick up the mail.

### Memberships

By the end of January, those members whose expiration date is in June 2004 or earlier will be deleted from our rolls. This will simplify our operation, thus save more funds for positive actions. We may be able to reduce your dues beyond 2005 if we get a large positive response.

We do not want to lose any of you, but we have found this to be a necessary step. We do appreciate your continued support for these many years; it is just time to modernize.

### Chapters

We are in the process of establishing a number of chapters. You may find a listing at the bottom of the AEA homepage under member info. If you live near any of the chapters, contact the person at the bottom of each chapter web page to see if you can help in the formulation of that chapter.

We would love to start a chapter in Silicon Valley, if any of you live in that area and are interested in forming a chapter there e-mail [aea@aea.org](mailto:aea@aea.org) and let us know.

### Membership Cards

Please let me know if you have sent in your dues over 30 days ago and have not received your membership card. A few people fell through the proverbial crack when the computer crashed and we lost all of our records. If you know your membership number, approximate date you sent dues or your expiration date, I need this information as well as your address, e-mail address and all of the information on the application forms.

### Show Your Support

AEA encourages you to show your support by sending a copy of this newsletter, with your personal note, to your member of congress (House or Senate member) or the President of the United States. It can be E-Mailed to them as a PDF attachment (send us an E-Mail, [BillR@aea.org](mailto:BillR@aea.org), and we will return a newsletter in PDF format) or faxed to them (we do not advise using the US Postal Service to contact politicians because of the enormous delays). Be sure to include your full name as well as a complete mailing address, telephone number and E-Mail address. A complete address is important because lawmakers want to know that you are in their district or state and they may want to contact you.

**Latest Numbers from the [Bureau of Labor Statistics](#)**

<u>Consumer Price Index:</u>	+0.2%	Apr 2004
<u>Unemployment Rate:</u>	5.6%	May 2004
<u>Payroll Employment:</u>	+248,000(p)	May 2004
<u>Average Hourly Earnings:</u>	+\$0.05(p)	May 2004
<u>Producer Price Index:</u>	+0.7%(p)	Apr 2004
<u>Employment Cost Index:</u>	+1.1%	1st Qtr of 2004
<u>Productivity:</u>	+3.8%	1st Qtr of 2004
<u>U.S. Import Price Index:</u>	+0.2%	Apr 2004

**Other DOL Statistics:**

<u>Unemployment Initial Claims:</u>	339,000	May 29 2004
<u>Federal Minimum Wage:</u>	\$5.15	

The civilian labor force is the sum of employed and unemployed persons. Those not classified as employed or unemployed are not in the labor force. The unemployment rate is the number unemployed as a percent of the labor force.

<b>Exclusive at the AEA website:</b>	
<i>Find your local chapter</i>	<a href="http://www.aea.org/chapters/">http://www.aea.org/chapters/</a>
<i>An Open Letter to the Republican Party by AEA President Bill Reed</i>	<a href="http://www.aea.org/documents/statements/reed_letter.htm">http://www.aea.org/documents/statements/reed_letter.htm</a>
<i>20 Defenses of Offshoring and Why They Are Wrong</i>	<a href="http://www.aea.org/20_refute.htm">http://www.aea.org/20_refute.htm</a>
<i>Guide To Pending Tech-Visa Legislation</i>	<a href="http://www.aea.org/legislation.htm">http://www.aea.org/legislation.htm</a>
<i>AEA By-Laws</i>	<a href="http://www.aea.org/documents/aea/by-laws.pdf">http://www.aea.org/documents/aea/by-laws.pdf</a>
<i>Why an AEA?</i>	<a href="http://www.aea.org/documents/tax/why_an_aea.pdf">http://www.aea.org/documents/tax/why_an_aea.pdf</a>
<i>RAND Corporation Study Finds No Tech Labor Shortage</i> (link)	<a href="http://www.rand.org/publications/RB/RB1505/">http://www.rand.org/publications/RB/RB1505/</a>

There is much, much more, so visit the AEA website and find out for yourself.

Additionally, make the AEA membership grow by passing on the AEA URL ([www.aea.org](http://www.aea.org)) and this newsletter to all your colleagues and encourage them to join and participate. As mentioned by Bill above, send us an E-Mail request ([BillR@aea.org](mailto:BillR@aea.org)) and we will forward a PDF copy for easy attachment.

# American Engineering Association Membership Application Form

The American Engineering Association is a National, non-profit corporation dedicated to the enhancement of the engineering and scientific professions and our nation's continued technical leadership. Our members are from virtually all disciplines of the nation's technical community.

If you are concerned with the direction of the technical professions, we urge you to join with us in working to improve the professional lives of the nation's technical professionals.

Please fill-in the form below and mail OR use our *on-line form*:

<http://www.aea.org/application.htm>

**You must be a citizen or permanent resident alien to qualify for membership in the American Engineering Association.**

I certify that I am a U.S. Citizen  or Permanent Resident Alien  (please check one)

**Please accept my new membership  or my renewal**

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

**Company:** \_\_\_\_\_

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

\_\_\_\_\_

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

**Home Phone:** \_\_\_\_\_

**Work Phone:** \_\_\_\_\_ **Ext:** \_\_\_\_\_

**Fax:** \_\_\_\_\_

**E-Mail Address:** \_\_\_\_\_

**URL:** \_\_\_\_\_

**U.S. Representative:** \_\_\_\_\_ **District:** \_\_\_\_\_

Life Member: \$1,000.00

Sponsoring: \$100.00

Professional: \$50.00

Member: \$30.00

Retired/Unemployed: \$20.00

Student\*: \$15.00

**Please accept my donation  
in the amount of:**

\$

\*You must be a full time student to qualify for the student rate.

**We welcome your suggestions and comments:**

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**Thank you for your desire to leave a better profession for our children and grandchildren than you came into!**

**Mail to:**

American Engineering Association  
4116 S. Carrier Pkwy  
Suites 280-809,  
Grand Prairie, Texas  
75052