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Printed Circuit Boards To Become Part Of DOD's 'Trusted' Production Program

The Department of Defense has developed a strategy to deal with the erosion of the U.S. printed circuit board industry and its growing inability to make parts that can be "trusted" for systems used in national security and military weapons systems. A task force made up of representatives from 10 military agencies, the National Security Agency and the State Department agreed with a 2005 National Research Council report that recommended DOD begin a multi-structured program aimed at creating a "trusted" supply of printed circuit boards. "DOD concurs with comments on all National Research Committee recommendations, discussing current and potential actions to address" the loss of U.S. printed circuit board technology and production capability, according to the strategy report.

In its study of the industry, the panel found that the majority of production of printed circuit boards now takes place outside the United States and that what little is being spent in the United States on research and development does not focus on developing new materials and products.

"DOD will not be able to take full advantage of state-of the-art commercial-off-the-shelf printed circuit board technologies and will pay more for custom low-volume printed circuit boards," says the assessment. "There is neither an economic advantage nor an incentive for these high-volume manufacturers to develop and maintain low-volume state-of-the-art printed circuit board facilities for DOD requirements and to develop new materials or processes for improved manufacturing of printed circuit boards. Further, OEM internal cost cutting pressures impede innovation. Currently there is little incentive for large defense contractors to invest in internal R&D to improve the performance of printed circuit boards to compete for and win government contracts."

The task force recommends that printed circuit boards be included in the "Defense Trusted Integrated Circuit Strategy," an increasingly important DOD program aimed at dealing with the shift of high-tech production overseas.

"Ensuring a supply of trusted integrated circuits is necessary, but it is not sufficient to remove risks and vulnerabilities associated with populated printed circuit assemblies," writes the task force in its report that was requested in July 2006 by Congress. "Extending the Defense Trusted Integrated Circuit Strategy to include printed circuit boards (and possibly printed circuit board mounted components) could mitigate the risks posed by tampering and counterfeiting....While DOD has not experienced specific disruptions to date, the globalization trend beginning in the 1990's has increased this vulnerability," according to the strategy

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Ohio Voters Don't Trust Democrats On Economic Issues

In the recent Ohio Democratic presidential primary race, NAFTA sounded like it was the most important aspect of battle between Sens. Hillary Clinton and Barack Obama. But it wasn't.

When it came time to vote, the over-riding issue became the candidates' race and gender. The least offensive of the two — gender — ended up being the winner.

Since President Bill Clinton pushed NAFTA through Congress in 1994, middle-class voters in Ohio's presidential elections have swung distinctly into the Republican camp. Both Obama and Clinton were neutralized on economic issues, according to John Russo of Youngstown State University. Neither candidate was trusted to do what is in the best interest of working class and

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On Hold For A Year: Basic Measurement Infrastructure For Quantum Computing, Nanotechnology & Hydrogen Fuel Cells

The Democratic Congress's last-minute decision in December to reduce 2008 funding for the federal physical science accounts will have a big impact at the National Institute of Standards and Technology this year. In an assessment of its current budget, NIST says that its effort to put the United States in better standing in the "fiercely competitive global environment [with] cutting-edge measurement technologies and rigorous standards" will be put on hold "for at least a year."

Developing increasingly sophisticated and precise measurement systems for frontier technologies used in virtually every industrial sector "will require advances in the science of measurement," NIST points out. "Successful development and introduction of important next-generation products will hinge on progress on several measurement-related fronts." NIST has found that every dollar invested in measurements and standards yields $44 in benefits for the economy.

But that argument did not make it into the heads of members of Congress. In a showdown with President Bush, Congress decided that virtually every other program in the $516-billion Consolidated Appropriations Act (HR-2764), including 11,900 pork barrel projects, were more important priorities. Those who follow the science budget say the Democratic Congress played a game of retribution: it did not provide funding for programs supported by President Bush.

NIST's Scientific and Technical Research Services, its measurement laboratories, received $440 million for 2008, an increase of $5.3 million (1.2 percent) over 2007. President Bush requested a 15 percent increase, or $66 million.

"The lower funding provided compared to the President's budget request will have negative impacts on NIST and its customers and partners in industry, academia and other agencies," says NIST in its "Three-Year Programmatic Plan" submitted to Congress in February. "Those impacts include a real loss in timely research that yields positive benefits for the nation."

The paltry budget for measurements means that NIST will suffer a $13-million shortfall to cover salary increases and other costs. NIST will not be able to hire 300 staff and guest researchers that it had planned under President Bush's budget request.

"NIST managers are reviewing laboratory and administrative activities to ensure that ongoing high priority projects receive the funding that they need," according to the NIST planning document.

In the area of nanotechnology, NIST's program to develop more accurate detection and measurement systems will be slowed, thereby reducing "industry's ability to exploit the economic potential of nanotech safety." The funding shortfall also "limits the development of next-generation nanotechnology-based cancer therapies, and weakens consumer confidence in nanotech products," according to NIST.

Without a new generation of measurement tools, industry will not be in a position to determine the "potential toxicity and environmental impacts of nanoparticles," says the agency. "The bottom line is that hundreds of products already contain nanoscale components and materials and the safety of these products is unknown. As a result, industry is increasingly concerned about future potential liability issues. Regulatory agencies lack the basic scientific information they need to protect the public. In light of these concerns, the scientific community fears that the next breakthrough in nanotechnology may be smothered by uncertainty before it has a chance to be born."

In the lucrative growth area of quantum computing and optical communications, lack of funding "postpones by at least a year progress in transformational research that can increase the nation's competitiveness," says NIST. Lack of resources "delays development and implementation of absolutely secure solutions for financial and national security communications." As data transfer rates approach 100 gigabits per second and beyond, "measurements at these bandwidths are lacking," writes NIST, whose researchers, including three Nobel Prize Laureates, know about these sorts of things. "Improvements to the network are required to provide the capacity needed for universal broadband access in our nation." Currently few measurement tools exist to monitor the real-time performance of transmission links, making it slow and costly to re-route or reconfigure data traffic in a network.

The national goal of creating a viable hydrogen fuel system will also be put on hold. NIST is the lead agency for measurement systems related to vehicle fuels. With a reduction in funding for construction, NIST will delay completion of its Neutron Research Center, which will provide facilities to 500 researchers each year. Without funds to finish the center, three-dimensional imaging of hydrogen in operating fuel cells will be delayed. "NIST expertise will be essential for making fuel cells less costly and more reliable," writes the agency. "Neutron beams have become an indispensable research tool in materials science, biotechnology, chemistry, engineering and physics because of their ability to image materials and structures nondestructively at atomic and molecular scales."

Congress did, however, manage to load up NIST's construction budget with its own projects, adding $51 million for health facilities in Alabama and Mississippi. Congress also threw a $30-million "competitive construction grants" program into NIST's budget that the agency did not request.

This year's funding shortfall will also negatively

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NAM's Up-And-Comers Are Out-And-Going

The exodus continues at the National Association of Manufacturers. After three years under Michigan Republican Gov. John Engler's presidency, the staff remains unsettled, with a second major organizational restructuring taking place in February, say those on the inside. That shake-up has led to another wave of departures, this time among the middle ranks of employees. The first wave led to the departure of about 80 staff members, according to current and former employees at the 112-year-old trade association.

Some NAM workers continue to express confusion over what's happening within the organization, unsure of how turnover is perceived by the NAM board, the association's members and the outside policy community with whom employees interact. Other managers say staff turnover is no big deal — normal attrition — not worthy of a gossip column, and is being propagated by people with an ax to grind.

Former NAM personnel who spent decades at the organization say that in the past during an average year three or four people voluntarily left the organization, but that number has already been surpassed in 2008.

Manufacturing & Technology News has received dozens of e-mails, phone calls and packages from current and former NAM employees, imploring us to write stories about the situation. "There is complete and total turmoil over here," writes one employee. "All of the policy staff turned over and keeps turning over, and now communications....People are leaving from all corners of the organization."

Here are the some of the recent departures:

Brian McGuire, senior regional manager in NAM's field division has left NAM to become executive vice president of the Tool & Manufacturing Association of Illinois. "We will miss Brian's political sense, his wit and insight," wrote Bob Cunningham, NAM vice president of human resources, in an e-mail to NAM employees announcing McGuire's departure. "We are excited for him as he takes his career to the next level."

J.P. Fielder is leaving as NAM's senior director of strategic communications, a new position that was created for him in late February after a restructuring of NAM's communications operation. Fielder is moving a few blocks away to join NAM's chief rival, the Chamber of Commerce, where he will be associate director of media relations. In his new job, Fielder "will continue to build on an already distinguished career in media relations," writes Cunningham to all NAM employees on March 7. Fielder joined NAM in 2006 "and quickly established himself as an outstanding media and communications professional," Cunningham notes.

Jason Straczewski, NAM's director of employment and labor policy who led NAM's important "card check" legislative initiative, has taken a position at the International Franchise Association. "We are thrilled that Jason has received this great opportunity and his energy and high performance will be greatly missed," wrote Jeri Gillespie, NAM's vice president of human resources policy in a memo announcing his departure to staff. "We are working diligently to find a new Employment & Labor Policy Director and appreciate your patience during this process. Please join me in wishing Jason well in his new position, but importantly thanking him for his stellar work during his career here."

Greg Snapper, senior director in the communications division who was promoted on Feb. 19 to head up NAM's renamed Broadcast & Multi-media Strategies department, has quit to become the online project manager at Pacific Gas & Electric Co. in San Francisco. Snapper joined NAM last year to work on the Internet "and has done a terrific job in making improvements and devising innovative ways for us to reach out to our various audiences," Cunningham wrote in an e-mail to all NAM employees on March 7.

Irina Stepanova, a 10-year NAM employee and senior director of member communications and marketing services, left recently.

Julia Sydnor, a designer and editor also in the member communications and marketing services department, quit.

Kitty Brims, associate director of corporate communications who won employee of the year in 2005, has left after working at NAM for about 15 years.

Jackie Gilkes, senior executive assistant in NAM's corporate affairs division, "resigned" after 10 years at the organization.

People are not sure what has happened with **Dallas Lawrence**, a recent NAM hire who was vice president of broadcast, Internet content and production. Insiders say that he had been promoted to work directly for Mike Hambrick, senior vice president of communications to be in charge of "New Media," (as described on a Feb. 5 NAM organizational chart), but two weeks later they say he was demoted. He became assistant to NAM executive vice president Jay Timmon's assistant, Teresa Cupit. "If you have been working with Dallas on other matters, please work directly with Mike Hambrick as those responsibilities are re-assigned," wrote Timmons to staff on Feb. 11. Lawrence worked for former Secretary of Defense Donald Rumsfeld as director of community relations and public liaison at the Department of Defense. He served as director of regional media operations for Ambassador Paul Bremer in Iraq in 2004. He is believed to still be on NAM's payroll, but is no longer showing up for work, according to current employees.

Phyllis Eisen, executive director of NAM's Center for Workforce Success and senior vice president of NAM's Manufacturing Institute, recently submitted her resignation after having been with NAM for 20 years. NAM recently hired Emily DeRocco, a Bush political appointee at the Labor Department, who has been named president of the Manufacturing Institute. She replaces **Bill Canis**, who was acting president of the organization for the past year. Canis has become the Institute's vice president for research and innovation.

USTR's U.S. Production Claim Riles Union Boss Leo Gerard

A March 3, 2008, public notice issued by the Office of the United States Trade Representative entitled "NAFTA — Myth Vs. Facts" has riled up Leo Gerard, president of the United Steelworkers. The USTR states: "Myth No. 3: NAFTA has hurt America's manufacturing. Fact: U.S. manufacturing output rose by 58 percent between 1993 and 2006, as compared to 42 percent between 1980 and 1993."

Gerard doesn't buy it. "Can you print 'bullshit'? That is just pure bullshit. I am fed up with that crap," he says.

So how does Gerard explain the fact that manufacturing output is higher now than before NAFTA began? "We're not producing more steel. We're not producing more glass. We're not producing more cement. We're not producing more tires. We're not producing more of these either as a percentage of the economy or in real terms, and I can tell you that unequivocally," he told reporters on a recent conference call discussing the outcome of the Ohio primary election. "The fact of the matter is that those who hide behind this stuff are misrepresenting the facts."

The United States, Gerard added, can produce more tires per person at a Goodyear plant, "but Goodyear is not producing more tires than it used to produce in this country. We can produce more tons of steel per man hour, but we're producing less steel. We can produce more aluminum per man hour, but we're producing less aluminum. Take me through any of those industrial measurements where we represent workers and I will tell you that the system is failing and with every one of them we're importing more. Twenty years ago in steel, we had import penetration of 18 or 19 percent, now it's 30 percent, and it is coming from countries that subsidize and dump: Russia and China and other Asian countries and now India....If you look at where we are importing from, most of it — except for automobiles and automobile parts and oil from Canada, it is coming from NAFTA countries, like Mexico or from China or other Asian countries that have no worker standards or worker protections. And I'm not going to sit by and just keep swallowing that crap."

Lori Wallach, director of Public Citizens Global Trade Watch, has looked at the USTR fact sheet, and says "trick number one" is that it is not in inflation-controlled dollars. "When you control for inflation, you cut the growth by 40 percent. That's a math trick. What they also don't control for is the background growth rate of the U.S. economy, which is to say, whether or not you have the right trade policy, the growth rate of the U.S. economy is going to increase the volume of all goods and services in the economy and the proportion of them in each of the sectors. They don't control for that. If they wanted to do apples-to-apples, then both inflation and the background growth rate would have to be controlled for. We did control for those things and what we found is that export growth with the countries with whom the U.S. has free trade agreements — theoretically our tightest relations — is slower than with countries we don't have FTAs with and is slower than with the entire rest of the world. The growth rate for countries with whom we have FTAs is the lowest relative to our growth rate of exports with everyone else."

The USTR fact sheet also states that manufacturing exports in 2007 "reached an all-time high with a value of $982 billion." What the USTR does not mention is that imports have grown to an even higher record. "Import growth is four times what export growth is," says Wallach. "That is an $800-billion trade deficit. That is your failed trade policy. I've seen that fact sheet. It's been recycled time and time again, and we reveal their game and they still put it out."

Federal R&D Funding Is Declining

The federal government is reducing its investment in research and development, according to the National Science Foundation's Science Resource Statistics (SRS) division. In 2007, federal investment in R&D slipped to $116.4 billion, down from $117 billion in 2006. Adjusted for inflation, the 2007 amount is nearly a 3 percent decrease from the previous year.

The federal government continues to spend more on "development" than on "research." In the research category, federal support has dropped every year since 2004, when accounting for inflation. In 2004, the federal government spent $50 billion on research. By 2007, that investment had fallen by $3.5 billion to $46.6 billion, a drop of 7.2 percent. The biggest decline occurred in research at the National Institutes of Health (a 5.6 percent decline to $28.8 billion), but research funding at most federal agencies has "dropped or shown negligible increases" between 2004 and 2007, says NSF.

Federal funding for basic research at $28.3 billion in 2007 has not grown since 2004, after adjusting for inflation, compared to annual increases of between 4 percent 10 percent between 1998 and 2004. Federal funding for applied research at $28.8 billion in 2007 declined by an average annual rate of 3.3 percent between 2004 and 2007, when accounting for inflation. In constant 2000 dollars, federal funding provided for applied research in 2007 ($22.7) billion is below what it was in 2002 ($23.5 billion).

Spending on "development" declined in 2007 to $57.5 billion. The Defense Department accounts for 86 percent of federal spending on development, at $50 billion in 2007; followed by NASA at $4 billion and the Energy Department at $2 billion. "After several years of substantial growth, averaging 10.8 percent per year between 2002 and 2005, obligations for development increased an estimated 2 percent between 2005 and 2006, and are expected to fall 3.5 percent in 2007," says the NSF.

5,000-Year-Old Metal Casting Industry Leaves U.S. Behind

From the perspective of a German company selling high-tech simulation software to metal casting companies, the United States industry is not very advanced. Its supporters claim that the United States leads in technology, but that is not the case, said Christof Heisser of Magma Foundries Technologies Inc. The United States has some advanced foundries that meet world standards, but not many, and when Heisser visits the majority of small- and medium-sized family-owned foundries in the United States he finds they are at a technology level "where not even the emerging markets have those foundries any more."

With a profit margin of only 5 percent in the best of times and only 2.3 percent four years ago, the U.S. industry does not readily invest in new casting technologies. "The foundry industry is very complacent because a lot of the owners who run the companies grew up in an environment where America consumed 95 percent of the product it made," said Heisser. "What was consumed here was made here." But that situation has changed, with imports now accounting for 22 percent of the U.S. market and growing fast.

The claims that the United States is leading in metal casting technology are "laughed off" by the rest of the world, said Heisser. "If you want to see leading technology, go to Europe, Russia, the East Bloc; go to Germany, India and go to China where you see brand new foundries and research being done. Go to Japan, but not the United States. There is just no way."

The United States industry is still primarily serving the U.S. market and there remains a "safe-island scenario," said Heisser. "So long as companies like John Deere and Caterpillar keep buying from small- and medium-sized producers, those foundries are fine. But as soon as they find that it makes sense to get 250 castings from China, Mexico, Brazil or Germany because the quality and price are right and the transportation costs don't matter, those foundries will not be able to compete."

Many countries that lead in casting technology are exporting 65 percent of their output. The U.S. export figure: 8.5 percent. The productivity of German foundries is 20 percent higher than the American foundry industry. The German industry invests continuously in new equipment and new technology. Its executives and workforce are never happy with what they have. There is a sense that whatever new equipment is purchased can be improved upon. In the United States "you go into foundries and they're proud of the fact that they have lines running since 1949," said Heisser. "It's a maintenance nightmare and not productive and can't compete on the global market because nobody would go to China to buy 250 brake drums."

The U.S. mentality is to invest only when times are good. When U.S. companies do invest, they have a tendency to scrap an entire line and start over again because they haven't made any incremental investments over the past 40 years. "In other countries you have continuous improvement. As soon as equipment is written off they buy something new," said Heisser. That's not the case in the United States.

Many of the metal casting shops that still can't or won't invest in new process equipment and manpower will soon suffer the same fate as those that haven't survived the shakeout of the last 15 years. When Heisser first came to the United States 13 years ago there were 4,500 foundries. The most recent number was 2,291, "and that number won't increase," he said. "It will still go lower."

There might be some development of new alloys on the light non-ferrous side of the business, and there is still activity on the iron side, "but there is not a movement of big foundries that say we have to change the market and invest in new technologies and attract new people," he said.

The United States industry is not tuned into global technology trends. At last year's International Foundry Trade Fair (GIFA), the largest foundry congress anywhere in the world with 77,000 attendees held every four years in Germany, "there were more Mexican and Brazilian foundries there than American foundries," said Heisser. Of the 1,700 companies renting booths to exhibit their capabilities, only one was an American company, along with the American Foundry Society. "We had only four of our U.S. customers show up and that's it. Even GM sent over one VP and that was it. This is the point: if the American foundry industry wants to compete globally, they have to communicate with the rest of the world and seize the challenges. They have to be exposed to the quality requirements and the opportunities overseas in the automotive industry, but again, a lot of foundries here in the U.S. serve local markets and don't care about what's going on in the rest of the world because they don't have customers there."

In the next five to 10 years, 60 to 70 percent of the industry's knowledge workers will retire. Replacing them will be difficult given that there are so few engineers training for careers in metal casting. "There will be a huge challenge for the small- and medium-sized foundries to stay alive just for the reason of not having the personnel, and we're not even talking about the people who do the work in the foundries, like cleaning castings, molding, maintenance and machining. From that point of view, only highly automated and efficient foundries with a perfect cost structure will survive."

Right now, there is no reason for foundries in the United States to invest in new technology because they are running at capacity with utilization rates of 90 to 95 percent, said Heisser. The industry might

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Printed Circuit Boards...

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document. "To mitigate these potential defense system vulnerabilities, future assessments and actions at the enterprise level should be broadened to address printed circuit board supply chain issues. This will require a more focused DOD-wide approach."

In its 2005 report on the industry entitled "Linkages: Manufacturing Trends in Electronics Interconnect Technology," the National Research Council found that U.S. production of printed circuit boards had fallen below 10 percent of world output (down from 40 percent or more in the 1980s). The U.S. industry is comprised of small companies unable to invest in new technology. Most high-volume production has left the United States. It said the U.S. military stopped investing in the sub-tiers of the electronics industry more than a decade ago and is now paying the price for that oversight.

Much of the investment that has been made in the military's printed circuit board infrastructure has come through the form of congressional earmarks. Concerned members of Congress added just enough funds to sustain a printed circuit board R&D capability, since the Defense Department was reluctant to do so on its own.

The DOD team found that the military services' four printed circuit board engineering and manufacturing facilities are not that impressive. "There currently are limited expertise-focused strategic investments in advanced printed circuit board manufacturing capability," the task force concluded. "This lack of investment potentially could lead to a gap in printed circuit board organic capability to support the sustainment mission."

The DOD group studying the issue recommended that the government create a new "executive agent" for printed circuit boards "to monitor manufacturing, materials, processes and component vulnerabilities." This executive would develop a printed circuit board roadmap that assures manufacturing capabilities and expertise to meet future military requirements; evaluate recapitalization and investment requirements of DOD's printed circuit board facilities; assure continuing printed circuit board knowledge and expertise; increase DOD program offices' awareness of the benefits of leveraging currently available printed circuit board capabilities; and developing methods to assure the availability of needed technical data.

The executive agent will be in charge of continuously assessing the vulnerabilities and trustworthiness associated with the printed circuit board supply chain. "DOD currently does not address trustworthiness at the printed circuit board level," according to the report. The Defense Logistics Agency would be in charge of accrediting trusted sources of supply, similar to what is being done with integrated circuits.

At the request of Congress, as contained in the National Defense Authorization Act for fiscal year 2007, the Defense Logistics Agency and the Naval Surface Warfare Center Crane Division put together a "Principal Response Team" to study the printed circuit board dilemma. Among those on the team were representatives from:

- The Office of the Deputy Under Secretary of Defense
  - Logistics and Materials Readiness (L&MR)/SCI
  - Acquisition and Technology (A&T)/IP
  - Defense Research and Engineering (DDR&E/AS&C)
- Defense Logistics Agency Headquarters
- DLA's Defense Supply Center Columbus (DSCC)
- National Security Agency
- Defense Microelectronics Agency (DMEA)
- Department of the Army (AMCOM-Huntsville)
- Department of the Navy (NAVSEA-Crane)
- Department of the Air Force (Warner-Robins ALC)
- Department of State
- Department of Energy (Sandia National Laboratory)

Mfg. Productivity Improves More Overseas

U.S. manufacturing productivity growth wasn't very good in 2006 compared to most foreign competitors, according to the Bureau of Labor Statistics. South Korea's productivity improved by 11 percent in 2006 followed by Germany and Taiwan at 7 percent. The United States improved manufacturing productivity by 2 percent, ranking it in 12th place among industrialized countries.. Canada was the only economy with a decline in productivity at 0.1 percent. The report is located at http://www.bls.gov/news.release/prod4.nr0.htm.

NIST Measurements On Hold...

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impact the development of calibration systems for satellite sensors that would be used to improve the accuracy of climate change measurements. NIST will also delay the development of building codes and standards used by the building industry to reduce the $52 billion in annual costs associated with the destruction to structures caused by earthquakes, floods and fires.

NIST is running into funding problems at its Boulder, Colo., facility as well. The agency's JILA facility (formerly known as the Joint Institute for Laboratory Astrophysics), is operating at over capacity "and the situation is getting worse," says NIST. "The existing group of 28 JILA research scientists could train approximately one-third more postdocs and student researchers, but there is literally no place for them to work. Current laboratory space is so cramped that safety concerns may begin affecting the lab's operation."

Lack of cold rooms for biophysics research and clean rooms to support research in nanometer-scale electronics is threatening JILA's "ability to retain and recruit world-class scientists," according to an external assessment of the situation. NIST needs $27.5 million to expand the lab.

GUEST EDITORIAL: PETER MORICI

Why The Dollar Is So Cheap And Euro & Gold Are So Dear

The dollar is trading at all time lows against the euro and gold for good reasons. The Bush administration has flooded the world with greenbacks, and global investors have little confidence in the management of the U.S. economy. During the Bush years, the U.S. trade deficit has doubled. Thanks to dysfunctional energy policies and tolerance for Chinese mercantilism, the deficit has exceeded $700 billion each of the last three years and is more than 5 percent of GDP.

The Bush energy policy emphasizes incentives for domestic oil production and letting rising prices instigate conservation but those have failed. Domestic crude oil production is falling, the price of gasoline has risen from $1.51 to $3.21 per gallon, automakers have populated U.S. roads with fuel guzzling SUVs, and petroleum now accounts for about $380 billion of the trade deficit.

Cheap imports from China have chased millions of Americans from manufacturing jobs, as the U.S. purchases from the Middle Kingdom exceed sales there by nearly five to one. The trade deficit with China is about $250 billion.

China has engineered this competitive triumph by keeping its yuan even cheaper than the dollar, euro and gold. Annually, it sells at deep discount about $460-billion worth yuan for dollars, euros and other currencies in foreign exchange markets. That provides a 33 percent subsidy on Chinese exports and keeps Chinese goods cheap on the shelves at Wal-Mart.

The Bush Administration has sought changes in China's currency policies through diplomacy and has failed. Paradoxically, Treasury Secretary Henry Paulson has managed to tar as protectionist any proposal for U.S. government action to offset Chinese subsidies.

The remainder of the trade

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Metal Castings...(From page five)

bemoan the fact that China's market share is growing in the United States, but U.S. companies do not have the capacity to serve their own market.

The wind energy turbine industry is desperate right now for castings, but the U.S. casting industry does not have the machining capacity to serve this fast-growing market. "If I was the government and looked at the entire manufacturing capacity of the United States, I would want to know how to encourage a company that has a backlog of 50 castings for wind turbines but doesn't have the guts to open a new foundry— how can we help those people do that? How do we get it into the education system that foundries are an interesting and challenging place to work? Quite frankly, we can't even get scientists interested in our industry any more. Then if you try to hire them from outside the United States, the whole visa situation is restricted. With the H-1B visa there are 140,000 applicants in two days for 56,000 open visas. That is why a company like Microsoft builds a research center in Canada: because it can't get the people in this country."

The U.S. government should be making the incentives to build wind turbines permanent, so that industry is willing to invest in the capacity. The wind turbine manufacturing industry in Europe is booming right now because the EU has guaranteed that the industry will receive tax credits and incentives for the next 15 years. But in the United States, legislation authorizing tax credits changes every two or three years. "The foundry industry sitting here in the United States says they would love to build a foundry for those wind mill castings, but at the end of 2007, the whole thing runs out and then what? They'll be sitting with millions of dollars of investment. If they know it will go on for the next 15 years, they would build the foundry."

One medium-sized U.S. foundry recently purchased Magma's simulation software. The company founder told Heisser that his customer threatened to take its business elsewhere because the cost of his castings was too high. The foundry was producing a casting with five risers. After utilizing the Magma software it was able to reduce the number of risers to only one. The cost to the customer went down and the foundry's profit went up.

"It was a great story, but I cannot believe that there are foundries out there that still make castings with those five risers," said Heisser. "This is where America is lagging behind other countries. In other countries they could never survive with that kind of attitude."

Magma is doing well given the upcycle. The company has 120 employees worldwide, with 14 in the United States and 75 in Germany. In the simulation software arena for castings, it is the largest company in the world, with the next biggest company having only eight employees. Simulation technology has advanced enough to predict the mechanical properties and microstructure of iron castings, and can partially do that for steel, aluminum and nonferrous castings.

The goal is to create simulations to cover casting from design through manufacture — through heat treatment and machining — and to transfer data to finite element codes that even simulate car crashes "that are based not on the assumption that the part is perfect and has a homogenous microstructure and mechanical properties but actually has a distribution of defects," said Heisser. "We do this already in Europe, but we haven't done it that much again in the United States."

There is a goal throughout industry to simulate a product from before it is made until after it is put into the field. "If you talk to John Deere or Caterpillar or the automotive companies, they don't want to build prototypes," said Heisser. "The first part they make and the product they make should be the one that goes to the customer and doesn't get test driven."

Ohio Voters...

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middle-class families in Ohio.

The last minute revelation that Obama senior economic advisor Austan Goolsbee, 37, a University of Chicago professor, told the Canadian consulate in Chicago that NAFTA was safe despite Obama's rhetoric, played into Ohio voters' long-held belief that a Democratic presidential candidate will say anything in Ohio in order to get elected.

Hillary Clinton is also not trusted because of what her husband did with NAFTA as president, said Russo, who conducted focus groups with voters before the election. In 1992, there was an enormous outpouring of support from labor and community groups to push Bill Clinton to victory in Ohio. Within two years, Clinton had successfully spearheaded NAFTA and welfare reform, both of which "dramatically impacted manufacturing workers" in Ohio, says Russo, co-director of Youngstown State University's Center for Working Class Studies. These workers "were going to punish anybody who voted for NAFTA and, after 1994, they've done it."

In 2000 this was expressed by the majority of working-class Ohio people voting Republican on issues related to guns, God and gays; followed by the 2004 presidential election when they based their vote on the issue of security. In both elections they shunned the Democratic nominee's calls for economic reform. "They still do not trust Democrats and they haven't come back to the Democrats," says Russo. As a result, in the Clinton/Obama showdown, Ohio Democrats voted on racial and gender identity and not their economic or class interests.

One white male said in a focus group with Russo that he was against the Iraq war but that he would not vote for a woman or a black man. "It is amazing to hear that, but it's not just the working class perspective," says Russo. "Nobody really wants to talk about it directly, but any time you have an economic crisis, which we are in, it undermines the idea of privilege that white males have."

Given economic hardship, white males believe that women and people of color are taking their jobs. "There is a resentment that plays into racism and sexism that is in many people regardless of class," Russo explains. As a result, in Ohio "race trumped gender."

The economic problems confronting Ohio over the past 25 years are descending upon many other communities, Russo believes. "A lot of people in service and financial jobs are starting to suffer and are beginning to know what Youngstown has known for 30 years," he notes. "People keep coming back here to see what they can learn."

What they learn is that Youngstown has never recovered from the loss of 50,000 good-paying manufacturing jobs over a 10-year period. "If the Democratic candidate doesn't talk to those economic issues and talk to them directly, [voters] won't see a major difference between the parties," and will base their vote on the race and gender of the candidate — in this case, John McCain.

Trade & Manufacturing Issues Play Central Role In Presidential Campaign

Trade, trade and more trade. That's what's on the presidential primary agenda over the next couple of months, as the Democratic battle between Sens. Barack Obama and Hillary Clinton heads into the industrial states of Pennsylvania (April 22), North Carolina and Indiana (May 6), West Virginia (May 13), Kentucky (May 20), and a possible do-over for Michigan sometime in June.

But the "fair trade" community — those who are bristling over the free trade agenda that has been pursued by Washington for the past 30 years — isn't very pleased with the debate so far, which has centered on NAFTA, NAFTA and more NAFTA. Not much has been said about China, nor about how trade agreements need to be restructured beyond the belabored call for new labor and environmental standards.

"I appreciate that the leading Democratic candidates had a spirited discussion about NAFTA," says United Steelworkers International President Leo Gerard. "But the fact of the matter is you can't fix NAFTA by putting in environmental rights and labor rights and pretending that will fix it. In fact, Canada's environmental and labor standards are higher than America's. Mexico's are also higher, but they're not enforced."

NAFTA "is just a proxy for a broader set of issues," adds Lori Wallach, director of Public Citizens Global Trade Watch. "The focus on the issue will grow. Recent polling shows the independent and even self-identified Republican voters [believe] that the current trade model is a net loser. McCain is an unreconstructive NAFTA booster relative to the positions taken by the" two democratic candidates.

In a poll of Ohio voters taken by the firm of Moore & Van Allen shortly before the March 3 Ohio primary, 96 percent of Ohio voters said that jobs and foreign competition would be important to their vote in upcoming elections. Two-thirds of Ohio voters disapproved of the way in which President Bush is handling issues related to American jobs and foreign competition. Only 12 percent of Ohio voters said the growth of China's economy has been good for the United States; 84 percent said that outsourcing is not good for the U.S. economy; and 82 percent said lower standards for worker health and the environment in foreign nations is the reason for the loss of American jobs.

The anti free-trade movement wants the debate to start focusing on how trade agreements can be changed to stop providing investment incentives to companies to locate production offshore; about unfair foreign industrial subsidies; about the lack of U.S. government enforcement of trade laws; and the need for a "new trade paradigm" that centers on the creation of American jobs, says Rep. Gene Green (D-Texas).

Adds Wallach: "There is no way to avoid making changes in the current

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Chief Of Boeing's Labor Union Chastises DOD Tanker Deal

If the $40-billion EADS/Airbus KC-45 tanker deal with the Air Force impacts one group, it's the 120-year-old International Association of Machinists and Aerospace Workers (IAM), headquartered just outside Washington, D.C., in suburban Maryland. *Manufacturing & Technology News* editor Richard McCormack spoke with its president Tom Buffenbarger about the deal, worth potentially $100 billion, its prospects for being cancelled and what it means for his organization and Boeing. Here is what he had to say:

Q: Why would IAM defend Boeing given its record on offshore outsourcing so many of your jobs?

Buffenbarger: The platform that Boeing was proposing to use was the 767, which has the higher U.S. content in it than the Dreamliner, along with the Pratt & Whitney engine that goes with it. [Defense Secretaries] Rumsfeld, Gates and the Bush administration have been very quick from day one to issue waivers for Buy America purchases. But with this deal, 40 billion of taxpayers' dollars will be spent on 180 planes at a time when the economy is faltering. We're going to give that to the French government? I don't think so.

Q: On the EADS Web site, it is duly noted that only 15 percent of the Airbus is French, so maybe the French content argument is overblown.

Buffenbarger: Our sister unions in France are in league with us on this because they've been told that the A-330 platform and assembly line will probably be moved to Mobile, Ala. They are losing jobs as well.

Q: If the U.S. is getting jobs that would otherwise be in France, isn't it a good deal for the United States?

Buffenbarger: We will gain 2,000 jobs in Mobile, Ala. The French will lose 3,000 to 4,000 jobs in Toulouse. We lose more and more control of the technology that the taxpayer dollar has paid to develop. That is my big complaint. If I'm a taxpayer in America, I would expect my tax dollars to be used as part of the jobs engine for the United States of America.

Q: That argument falls on deaf ears.

Buffenbarger: But it's the right argument.

Q: I haven't heard the public "outrage" that followed the Dubai Ports fiasco.

Buffenbarger: It may have hit at a fortuitous time. We're in a two-war front. We have peacekeeping missions around the world. Our standing as most favored nation among a lot of these folks — even some of our "allies" — isn't the best. Our own economy is faltering. People are losing jobs. Unemployment is on the increase; oil prices are skyrocketing.

Why would we want to say to the American taxpayer after we have pummeled him, kicked him and spat on him that we're going to take what little you have got left and build our military with foreigners? There is something fundamentally wrong with this.

It all falls on the heels of the last Quadrennial Defense Review that concluded that we don't have the capability in this country any more to ramp up in the event we had to face some national catastrophe or threat. Why exacerbate an already bad problem?

Let's take stock. Let's look at where we are. Manufacturing our prosperity is imperative because if we lose the ability to manufacture, and we lose the ability to manufacture the means of our defense, then the United States of America becomes a footnote in history like other great civilizations. I don't want to live during the time that we fell.

Q: The Air Force gets a great deal and the warfighters get an excellent tanker sooner. You have a lot of rational arguments in favor of the deal coming out of the Air Force and the people making them are articulate.

Buffenbarger: I find it outrageous that people stated that U.S. jobs and the U.S. economy were not taken into consideration for this decision. They can spend my money and your money and they don't care about what happens?

> *"Remember entering the conflict in Iraq. Where were France and Germany?"*

Q: The Buy America Act has a special exemption for a dozen countries so that when it comes to procurement, DOD is told to treat those countries as if they are the United States.

Buffenbarger: They don't treat us as if we're part of their country. Remember entering the conflict in Iraq. Where were France and Germany? I'm trying to think now, if my memory serves me correctly, they were on the sidelines someplace.

Q: Is there a way to reverse this decision?

Buffenbarger: Oh, yes. As Congress becomes more aware of what defense spending means to America's economic engine and the fact that Boeing spends billions in many of the key states in this program, I think you're going to see a real effort being made to either reverse the Air Force's procurement decision or defund it for the current fiscal year and then bring it back with a different administration.

Q: Are there economic repercussions in doing that?

Buffenbarger: For who?

Q: For Boeing — its ability to sell aircraft throughout the rest of the world, and especially to European

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customers?

Buffenbarger: It's hard to say how nationalistic Europeans become. But I do know this much: when you take a look at outsourcing, [former Airbus and EADS CEO] Noel Forgeard made a speech to the International Metalworkers Federation's aerospace conference last held in Toulouse, France, four years ago. He said that Airbus by policy outsources no more than 35 percent of its work. That's telling us that, no matter what, we're going to get final assembly here — 2,000 jobs to bolt the fuselage together — but we'll never get any more than that.

Here in the U.S. we're lucky with the Dreamliner if we get 35 percent of the work. If that is the public policy or industrial policy by design for the French and German governments, then there is something fundamentally wrong with this globalization equation. Why are we the patsies for all of this?

Q: How does the United States stop being a patsy for all of this? Economic nationalism? Protectionism?

Buffenbarger: Let's take a look at one of the things that Airbus-EADS is citing, which is that their bid was more competitive. The thing that was missing that Boeing has to take into consideration is the cost of employees and specifically their health care benefits. That is not on EADS' books to worry about, but it's on ours. There is something wrong with that picture. Health care cost is the big one, but there are others. So if it's economic nationalism, they have it in France. It's time in critical industries that we think about incentives for companies to keep work here.

Q: I've been told by people close to the deal that Boeing will have to be quiet on this and others will have to go to bat for them because their Integrated Defense Systems division is bankrupt in terms of its ability to compete. Boeing had the opportunity to win this contract years ago, but got greedy. Now it could be humiliated if they expose themselves for how poorly operated and managed they are. So they are playing a dangerous game.

Buffenbarger: So then let's look at EADS and Airbus and the little scandals that took out Noel Forgeard and some of the other top folks. Here is a company that has gone through CEOs faster than Boeing has. I can make an argument that EADS is not the best managed

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DOD Contracting: Jobs Are Not Considered

When making the decision to choose the Northrop Grumman - EADS KC-45 tanker (based on the Airbus A-330 jetliner) over the Boeing proposal, the Pentagon did not account for economic issues associated with the program. "Job creation, location of assembly and manufacturing were not part of this evaluation criteria, according to the law," Sue Payton, Assistant Secretary for the Air Force for Acquisition, told a hearing of the House defense appropriations subcommittee. "The law has a special exemption under the Buy America Act for a dozen countries and it says we should treat those countries as the U.S. The Buy America Act is very clear on that. The countries that have companies that will be engaged in the new KC-45 are all on that exempted list. So the laws of federal acquisition and the provision of the Buy America Act are all being followed here."

Members of the subcommittee pressed Payton. "I wish I could award to somebody who offers things that I personally like," said Payton. "But I promised the House and the Senate when I went through confirmation that I would uphold the laws that are written of this country. Those things could not enter into the decisions made in acquisition and that is where I am finding myself."

Rep. John Murtha (D-Penn.), chairman of the subcommittee, said the Air Force decision to pick EADS has to be looked at in a political context. "We couldn't even get NATO to give us an additional 3,000 troops in Afghanistan," he told Payton. "In Iraq, they pulled back most of their force from Europe. They had 47,000 at one time, now 10,000. The political contradictions are very severe here and we have to take that into consideration — the technical transfer of information. This committee will make a decision if we want to move forward."

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company.

EADS has to be careful how to proceed, too. Remember they got the helicopter deal. The fact of the matter is the Sikorsky helicopter was by far a better aircraft, cost-wise and everything else. What is our government doing? What is the matter with the Defense Department? Who are we trying to appease here?

If caution is going to be the word of the day, everybody has a little bit to be worried about.

At the end of the day, the American people should have the security and peace of mind knowing that we have the capability to manufacture the means of our own defense. We never have relied solely on other nations, and we're quickly moving there. Maybe it's a wakeup call.

Q: You would have thought that would have happened with the presidential helicopter, but the wakeup call never came.

Buffenbarger: Look at how they played that. It was only for the president to fly around in. Nobody spent time in the press talking about or educating the public that there were a whole bunch of other helicopters involved in that deal.

Q: Why wasn't there any traction in that argument?

Buffenbarger: Because nobody would listen to us on it. We talked about that to other reporters, but nobody would pick up on the fact that it wasn't just the president's helicopter, it was a whole fleet of helicopters.

Q: Do you think the same thing happens again with the tanker — that it will slip into oblivion? Most Americans don't even know about the contract.

Buffenbarger: Look at the people involved. It's a good mix. We have some angry Republicans and some angry Democrats and they are senior people. They are well placed in their parties and in Congress. If there is one thing we can demonstrate on an issue like this it's bi-partisanship.

Q: Whenever Rep. Duncan Hunter's Buy America legislation made it to the floor of the Senate, John McCain was one of the first ones there to kill it.

Buffenbarger: He's got to be careful running for president now. We have all his quotes from the Senate floor. Here's Boeing spending about $3.5 billion annually in Arizona. EADS spends virtually zero. We're going to be educating the people of Arizona who work in the aerospace industry on this candidate. It's like Obama's NAFTA flap in Illinois. This is one of the stones we can hang around McCain.

Q: Alabama seems to be an enlightened place in terms of its willingness to attract jobs and industry by providing subsidies and enticements to the world's best companies. Why don't other states figure it out? Why doesn't the U.S. federal government start a national program of emulating Alabama?

Buffenbarger: The taxpayers of Alabama are going to subsidize these jobs and then we're going to take more money from the taxpayer to give to the French government to bring the work in. It seems to me the real educational experience is we ought to quit subsidizing foreign nations and foreign companies and start subsidizing companies in America that keep jobs here.

> *"Here is a company that has gone through CEOs faster than Boeing has. I can make an argument that EADS is not the best managed company."*

Q: Do you have many members in Northrop? Are the Northrop people feeling like you're not going to bat for them?

Buffenbarger: No. Who we have at Northrop are people in the shipyards. On the aerospace side it's nowhere near the size of a Boeing or a Lockheed. It's probably one of the lightest organized aerospace companies.

Q: So you don't risk hurting any of your own union members by trying to overturn the decision?

Buffenbarger: I have not heard one complaint.

Q: Boeing does not seem to be stopping their outsourcing trend. Is there a way for you to counter that as a labor organization?

Buffenbarger: To counter it is tough because every time we think we develop some strategy on it Congress will enable a law or pass a trade deal and screw us. That is why I have become an equal opportunity critic of Republicans and Democrats. Both have lost sight of their purpose, which is to represent the people of the United States.

Q: As the Democratic primaries have moved into the industrial states, the country has been subjected to a debate over de-industrialization.

Buffenbarger: You wouldn't be getting it if it weren't for unions like the autoworkers, the machinists, the steelworkers, the IBEW [International Brotherhood of Electrical Workers] and a lot of critical unions. We have been saying these things for a long time, but we could never get the candidates to discuss it because it was hard to tell the difference between Republicans and Democrats on trade, issues of outsourcing and international finance. We're starting to hit home, but it's only because so many people have lost their jobs.

There is nothing free about free trade. When the people of America wake up they are going to find out that they have paid a terrible price. It is now time for a candidate who is a bold thinker — an FDR type of candidate who will take stock of where we are and systematically start to fix the things we need to engage a healthy economy.

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trade system [if a Democrat is elected] because the future Democratic president's domestic policy priorities — creating jobs, countering wage inequality, rebuilding manufacturing and the infrastructure — all require that there be changes to our existing trade agreements. This gets to the direct causation between our current trade policies and job losses."

The trade agreements signed to date provide "massive investor rights" that promote relocation of American jobs overseas," Wallach argues. Investor protections that directly incentivize offshoring "will have to be removed."

The current model of free trade agreements along with the WTO contain investor protections that remove most of the risk for U.S. firms to locate production in a developing country. Prior to NAFTA and the WTO, "if you made the decision to go for the lower wages, you faced a lot of prospective problems, from being expropriated or nationalized and subject to conditions about domestic content requirement and local managers," Wallach explains. The new trading rules "get a U.S. company that wants to move to a developing country out of having to rely on that country's domestic courts. These new rights in the trade agreements are enforced by foreign tribunals." Trade-related investment protections "subsidized U.S. firms offshoring," Wallach told dozens of reporters phoning into a conference call on March 5. "A set of interests who wanted to go the low road strategy of offshoring got those protections put into those trade agreements. Getting rid of those in the agreements — the incentives to leave — would have a different outcome on U.S. jobs."

Gerard, whose union has 190,000 active and retired members in Ohio, has not endorsed either of the Democratic candidates. The flap shortly before the primary election over Obama economic advisor Austan Goolsbee telling the Canadian consulate in Chicago that Obama was only playing NAFTA for political gain perhaps revealed Obama's true colors on trade, but if that's the case, then Clinton's aren't much better.

"If we want to look at Obama's advisors then we also have to look at Hillary's advisors, and there is nobody more responsible for the economic mess that we're in than Bob Rubin [Pres. Bill Clinton's Sec. of Treasury and former CEO of Citigroup] and he's a key advisor," says Gerard. "Gene Sperling [director of President Bill Clinton's National Economic Council] is a key advisor. A number of her key economic advisors were the advisors to the former President that brought in PNTR [Permanent Normal Trade Relations with China] and brought in NAFTA. We are waiting to see an articulation by these two candidates of what it is they're going to do to fix future trade regimes, what they're going to do about China, what they're going to do about the erosion of our trade laws, about a WTO that does not work — of the 75 cases that have been filed with America losing 72."

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deficit is largely autos and parts from Japan and Korea, who through various means have kept the yen and won cheap too.

The huge trade deficit must be financed either by attracting foreign investment in new productive assets in the United States or by printing IOUs. Investment has only provided about 10 percent of necessary cash, so each year the United States sells currency, bank deposits, Treasury securities, bonds and the like to foreigners. Those claims on the U.S. economy now total about $6.5 trillion.

That floods world financial markets with U.S. dollars and paper assets that function much like U.S. dollars, what economists call liquidity. And, it evokes an iron law of the universe. If you print too much money, it won't have any value.

Until recently, most of that borrowed purchasing power was put into the hands of U.S. consumers by the large Wall Street banks. Essentially, through mortgage brokers and regional banks, those Wall Street banks loaned Americans money to buy homes and refinance their mortgages. In turn, the banks got the cash needed by bundling mortgages, as well as auto loans and credit card debt, into collateralized-debt-obligations — bonds backed by consumer promises to pay — for sale to fixed income investors, hedge funds and others.

The bankers could get reasonably rich on this scheme but got greedy. Last summer, we learned that the banks were not creating legitimate bonds. Instead they sliced, diced and pureed loans into incomprehensibly arcane securities, and then sold, bought, resold and insured those contraptions to generate fat fees, big profits and generous bonuses for bank executives.

Now investors ranging from U.S. insurance companies to the Saudi Royals are not much interested in buying bonds created by large U.S. banks, and the banks can no longer make loans to many credit-worthy consumers and businesses. Without credit, the U.S. economy cannot grow and prosper.

The Federal Reserve has direct regulatory responsibility for the large U.S. banks, and it is Ben Bernanke's job to require them to fix their business practices and resurrect the market for bonds backed by bank loans.

Yet, Federal Reserve Chairman Bernanke has offered no plan to address these problems, or even acknowledged the urgency of the situation. And, without a well functioning banking system, the U.S. economy heads into recession of uncertain depth and duration.

International investors, recognizing the U.S. economy lacks competent helmsmen at Treasury and the Federal Reserve, are fleeing the dollar for the best available substitute — the euro and gold.

When George Bush was inaugurated, the euro was trading at 94 cents and gold cost $266 an ounce. Now they are trading at $1.52 and more than $1,000 an ounce. That is a plain vote of no confidence in the Bush - Bernanke economic model.

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