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"The theme throughout all of these Visiting Speaker Events is to hit the issues at the forefront of creating a sustainable nation. Sustainability is simply defined as meeting your current mission with decisions that will not mortgage your future.

HSS is involved in collaboration efforts because we are a corporate organization with continuity. Experience from other corporations indicated that every organization that looked at sustainability and reaped the rewards from it, started out by making investments in safety and security."

Mari-Josette Campagnone. Senior Advisor to the Chief Health Safety and Security Officer

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"A nation is only as strong as its people and infrastructure - there are some sobering statistics to indicate that the U.S. is struggling to educate its people and maintaining the viability of its manufacturing base.

Today we spend more on K-12 education than any nation, yet we rank 33rd. Our higher education system remains strong but the graduates from U.S. graduate schools and PhD programs in S&T are mostly foreign students who are no longer opting to stay in the U.S. By 2010, 90 percent of engineers and scientists will live in Asia."

Mari-Josette Campagnone. Senior Advisor to the Chief Health Safety and Security Officer

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"The funding allocated by the federal government on basic research, as a percent of the GDP, has declined since 1975 – especially in the physical sciences.

In 2003, our manufacturing base accounted for 11 percent of GDP, a decrease of over 50 percent from the peak. Yet manufactured goods still make up the bulk of our trades."

Manufacturing outside the U.S. may save costs in the short term. But over the long term, issues have emerged that are costing the U.S. billions of dollars. Counterfeit parts have infiltrated the military creating real risks. We should also be concerned about our ability to surge our manufacturing capacities in a time of crisis.

American manufacturers are the cornerstone of our economy. U.S. manufacturing leads in innovation as evidenced by the fact that over 90 percent of patents annually are related to manufacturing.

Manufacturers create not only products but jobs, national wealth, and national security."

Mari-Josete Campagnone. Senior Advisor to the Chief Health Safety and Security Officer

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"Government/Industry partnership in innovation isn't a 'dirty dance'. The problem is that our firms are competing against other firms plus their nations. We have one hand tied behind our back. Our foreign competitors aren't going to change, so we have to figure out a way to make it work for us.

Advanced manufacturing is independent of the product being produced. You don't have to be manufacturing a high tech product to be doing advanced manufacturing. You can be an advanced manufacturer of toilet paper if you're doing it more effectively and efficiently than your competitors."

Eric Mittelstadt. Chief Executive Officer, National Council for Advanced Manufacturing

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"There are many potential hurdles and bottlenecks in going from invention and innovation to marketing a product and achieving widespread use. According to an article by Michael Shrage in Technology Review, being 'first to file a patent' has nothing to do with being first to market. Being first to market has nothing to do with being first to profitability. Being first to profitability has virtually nothing to do with how quickly, deeply, and ubiquitously an innovation spreads. In other words, there is no meaningful correlation, let alone causality, between a 'successful' act of invention and a 'successful' marketplace product…We shouldn't confuse the creation of an idea with its commercialization."

Eric Mittelstadt. Chief Executive Officer, National Council for Advanced Manufacturing

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"U.S. manufacturing is the largest in the world. We produce twice what China does. Manufacturing accounts for 75% of our industrial R&D, 66% of our exports, and employs 10% of our workers.

We spent the last couple of decades saying that engineering and manufacturing ought to be located next to each other so they could work together. And now we're going to send half of it overseas? Hardly makes sense."

Eric Mittelstadt. Chief Executive Officer, National Council for Advanced Manufacturing

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"The Chicago area recently did a study of small and medium sized manufacturers. Only 15% of them thought they needed to change the way they were doing business. Fundamentally that means that 85% of them aren't going to be able to pass a viable company on to their kids.

According to the press, since 2004 there's been a 'manufacturing czar'. But the focus has been on things like regulations and international trade. I haven't heard one word about trying to get 360,000 manufacturing companies in this country to go to 'high road' manufacturing with a skilled workforce and advanced technology."

Eric Mittelstadt. Chief Executive Officer, National Council for Advanced Manufacturing

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"Financial security is national security and vice versa. We have a serious deficit of both at the moment. Our economic situation is perilous and our defense industrial base is in tatters. We are told that as many as three million auto industry jobs are at stake, but our strategic defense industry has been equally threatened for a decade or more. Our nation is not only poorer but also highly vulnerable if we can no longer domestically produce weapons, equipment, and machinery vital to our national defense. Our strategic industrial base is closer to death than our auto industry, and we're at war."

Ron Ault. President, Metal Trades Dept. AFL-CIO

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"Shipbuilding is the last, the last remaining significant heavy industry in the U.S. And there is nothing we can't build in a shipyard, including nuclear reactors. Shipyards are the last arsenal left in America and if you're looking for an industry that could stimulate rapid economic growth, look no further than shipbuilding.

We view foreign 'kit ships' (modular ship components that are made overseas for final assembly in U.S. shipyards) as a serious menace to US shipbuilding.

A single shipyard in Communist China has the capacity to build more ships than all US shipbuilding combined."

Ron Ault. President, Metal Trades Dept. AFL-CIO

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"We're going need a lot of PhDs but we're going to need even more skilled-craft trade workers to do all the heavy lifting. There's an estimated 30 million kids who graduate from high school every year with no intention of going to college. We need to make opportunities for those kids to develop valuable and marketable skill.

Today, the supply of skilled craft workers can't meet current demand and will fall woefully short of meeting future demands. By some estimates we will need three apprentices for every one skilled craft worker now on the job. Best guess estimates from our affiliated unions show that we are roughly replacing one skilled worker for every three that are likely to retire. That leaves us with a scant choice…import skilled workers or reconstitute and provide the necessary support for our apprentice training programs."

Ron Ault. President, Metal Trades Dept. AFL-CIO

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"Back in the 1970s, the labor movement called for a National Industrial Policy, a roadmap that coaxes corporate, academic, financial, and labor interests in a direction where we might work together to create wealth by manufacturing things of value and selling them. It's time to revisit the idea of a National Industrial Policy.
Bill Winpisinger, a former president of the International Association of Machinists said it well… 'We cannot continue indefinitely taking in each other's laundry - the service based industry we have today.'"

Ron Ault. President, Metal Trades Dept. AFL-CIO

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"The value of a global presence to the overall U.S. economy is substantial. Every dollar Lockheed Martin spends with one of our (global) collaborative partners generates six dollars in exports from the U.S. back to those nations. It's an important piece for generating economic wealth for the nation."

Edward Morris. Director, Hardware and Manufacturing,
Lockheed Martin Corporation

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"Defense business models are shifting… previous models focused first and foremost on domestic markets and federally-funded development and only after product development on exports and co-production.

…More recent models reflect a shifting mix of defense, civil government, and customer-funded R&D that very much embraces the global supply chain.

…Emerging models recognize that working closely with global collaborators will enable us to have the funds available to develop the very best products for the nation."

Edward Morris. Director, Hardware and Manufacturing,
Lockheed Martin Corporation

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"Defense Industrial Base Challenges and Issues:

Advanced Manufacturing - Smart investments in manufacturing technology must continue.

Skilled Workers - I'm concerned about the small- and medium- sized companies in the U.S. and their ability to have workers that are skilled. Some job applicants cannot differentiate between a hammer, a wrench, and a screw driver.

Modernizing Defense Manufacturing Facilities - Our small and medium sized companies are not only competing against lower wages in China, they are competing against foreign companies that have the very latest manufacturing equipment - bought from Japan and Germany. There is as need to bring our small and medium enterprises up to the current capabilities that are resident in places like China."

Edward Morris. Director, Hardware and Manufacturing, Lockheed Martin Corporation

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"Global competition - We must encourage US companies to invest in manufacturing infrastructure. We also need to ensure equal footing by ensuring that foreign companies that sell products here and compete with U.S. firms also comply with the Foreign Corrupt Practices Act.

Environmental Protection - We must ensure that as some state and foreign environmental regulations ban certain substances when there are viable substitutes to maintain the technical performance of products. For example, the EU is banning lead in electronics, but right now there is no viable substitute for what lead does for electronics. Similarly, hexavalent chromium although a known carcinogen is also industry's mainstay rust mitigation chemical."

Edward Morris. Director, Hardware and Manufacturing, Lockheed Martin Corporation

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“There are those out there who would love to bring down a commercial U.S. airplane using heat-seeking missiles. The economic and psychological impact of such an event would be devastating.

The Man Portable Air Defense System (MANPADS) technology to counter this threat was developed jointly by the U.S. and U.K. The technology is spectacular and critical, and we must be extremely protective of it; we cannot afford to have it out in the real world. It is an example of a case where you want our government to be extremely restrictive in terms of the technology being developed here and those things that can be exported, either for support in design or for manufacturing.”

Jeffrey Palombo. Sector Vice President, Northrop Grumman Corporation

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"The MANPADS defense system was originally designed as a military capability but it is essentially ready for installation on commercial cargo and passenger aircraft. There is currently an argument as to whether, when, and how commercial planes will be outfitted with this technology and who should pay for it."

Jeffrey Palombo. Sector Vice President, Northrop Grumman Corporation

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"The Optoelectronic Industry and Technology Development Association projects that the annual market value for photonics and photonics-enabled products will exceed a trillion dollars in 2014.

Primacy in science and technology contributed greatly to our economic well being and national security. But the world has changed. Other nations are challenging us in science, but perhaps more importantly they are a lot more effective at translating science and technology into economic advantage. Although most photonics research and inventions originated in the U.S., currently Japan, Korea, Taiwan and Germany are winning economically."

Dr. Eugene Arthurs. Executive Director, SPIE

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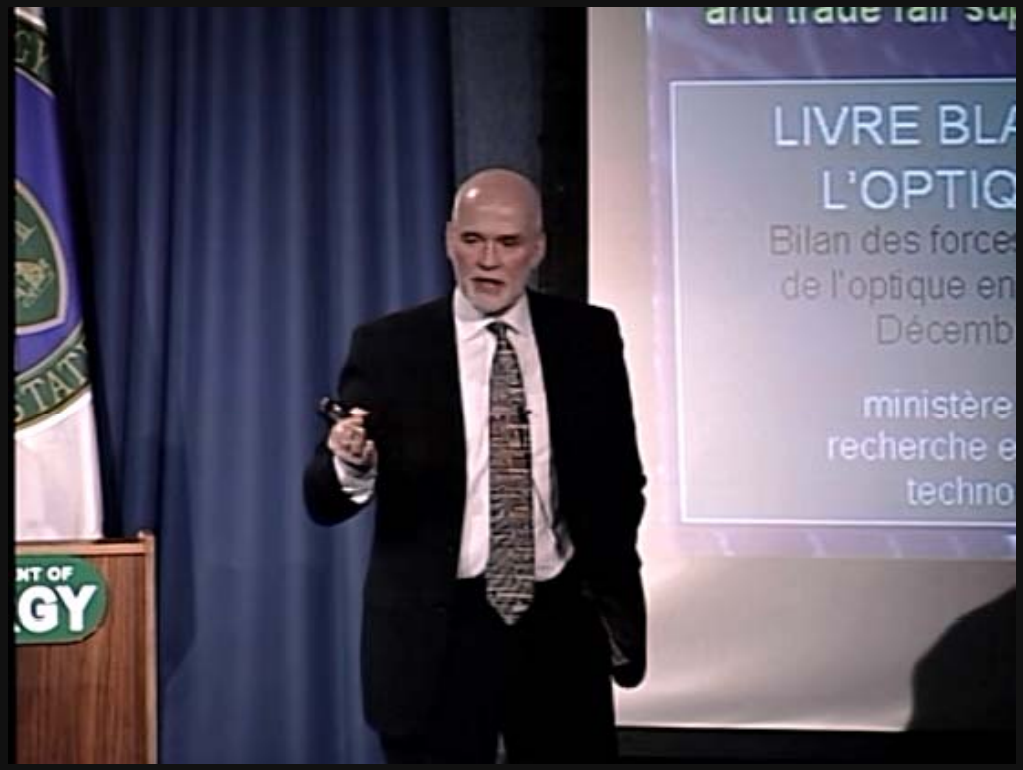

"Some people take R&D spending as a measure of the technological prowess of a nation and there's no doubt that the U.S. leads the world in R&D spending. We also have a wonderful venture capital supply, about $25 billion a year. But despite this R&D spending, our balance of trade in advanced technology products went negative in 2001 and the negative trend has continued. This is the report card we should be looking at.

Since the Korean War, Korea has grown from essentially no R&D investment to $30 billion annually despite its relatively small economy. Their national strategy not only produces scientific papers but it is also very economically driven.

Similarly, Taiwan has a very powerful Ministry of Science and Technology and a National Science Council. They control many Science Parks, including the largest and most sophisticated foundry for semiconductors anywhere in the world."

Dr. Eugene Arthurs. Executive Director, SPIE

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"Other nations have learned the means of putting science into business. The U.S. has not learned this.

In response to the current economic downturn, the Taiwanese government has offered to pay universities to hire research scientists who have been laid off. By subsidizing this human resource, the Taiwanese government is ensuring jobs for people they regard as key. The American Competitiveness Act was enthusiastically passed by Congress, but a year later funds had still not been appropriated.

Samsung, now a $100 plus billion company, is taking over the reigns of driving technology that was once driven by IBM and other American companies."

Dr. Eugene Arthurs. Executive Director, SPIE

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"I believe there should be significantly improved investment in basic research per the American Competitiveness Initiative and essentially a doubling of the relatively small budget for the physical sciences. But what's missing is a mechanism for getting that investment commercialized in the U.S.

It's wonderful to expand the frontiers of knowledge, but, for example, Mars will still be there in twenty years. Let's put a lot of the great talent at NASA to work on energy problems."

Dr. Eugene Arthurs. Executive Director, SPIE

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Panel Discussion:
"The speakers have discussed that we need to have a national policy on science, technology, and manufacturing that involves many players across all sectors. What do we need to do to achieve this? How do we get going to spark public will and leadership?" [Frank DiGiammarino]

"A national approach to S&T strategy is a multi-faceted, complex issue. It begins with looking at some of the cultural issues: we have a poor K-12 education system; we reduced funding for basic research; we are spending more money for video games than for sustaining technologies; and careers in manufacturing are not portrayed very favorably in TV shows and movies. Leadership is required to develop a roadmap on what is needed, timeline, and follow-through." [Ed Morris]

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"We as a nation need to address how to get our kids excited about developing and making things. Our society is about convenience; efforts and results that take time and persistence are often not valued. We, collectively and as individuals, have a responsibility to instill this excitement into our youths in order to energize our nation from the bottom up. If we only educate a small percentage of scientists and engineers in the world, it doesn't matter what we do from the top down, we're never going to catch up. Let's figure out to incentivize through the middle schools, high schools, and higher education if we're going to change." [Jeffrey Palombo]

"Motivation is an important element of leadership and it is difficult. Corporations should be involved at the community level to spark the interests of our kids to consider careers in manufacturing." [Ed Morris]