

Center for Chemical Process Safety Conference Speech Presented by Gary Veurink

Good morning! It is an honor for me to have been invited to be here today. I am delighted to be able to participate in this conference – especially considering that we are merging three very important process safety symposiums into this one venue. Our conference theme this year is oriented around addressing process safety challenges in a global economy—this is an area Dow finds very compelling, and so I'm pleased to see this focus and grateful to have the opportunity to share a bit of our perspective.

We have a broad cross-section of attendees today from industry, government, trade groups and other organizations, representing multiple countries. Such well rounded attendance can only serve to benefit the global industry, as well as our companies and organizations, so thank you all for being here.

By way of introduction, I'd like to share a little about my role at Dow. I'm our corporate vice president of Manufacturing & Engineering. That title means I'm responsible for nearly 200 manufacturing sites that are part of Dow's global operations in 35 countries. In addition, I have responsibility for our global engineering organization, which is directly involved in the design and construction of all new facilities.

My job is to make sure we, as a company, design and operate our plants so that we manufacture our products profitably, in compliance with all applicable laws and in the most safe, secure and environmentally sound manner possible.

Dow is no different than your companies. We place an enormous priority on our Environment, Health and Safety performance. Responsible Care® is at the heart of our decision making processes and our interaction with our customers, our people and our communities. And, for decades, we have had a *total* commitment to safety. At Dow, we have communicated a "Vision of Zero" for over 20 years. At the present time, we have a focused program called "Drive to Zero" -- zero accidents, zero injuries and zero excuses. That's how we define our safety efforts and that ultimately has been the focus of decades of process safety programs and procedures. Everything we do is aimed at achieving that goal. We are determined to eliminate all unplanned events.

Assuring effective process safety became a priority for me early in my career and today, thinking back over my career, I would define it as one of my great passions as a leader at Dow, as a member of this industry, as well as in many communities over my career, and as a husband, father and grandfather. Let me explain.

I started my career at Dow in the early 70s, working in the Chlor Alkali business. After working in the technology for several years, I was given manufacturing leadership responsibility for daily operations and maintenance in one of our plants. On a crisp October morning at about 9:00 am in 1978 (a day I will remember as clearly as most of us remember 9/11), we had a major liquid chlorine release from a failed valve. The

release was contained relatively quickly, but had a major impact on our employees and local community, including affecting elementary schools in neighboring townships around our plant. Between 50 and 100 people were treated for chlorine inhalation; seven people were admitted to the local hospital for overnight observation. One of those seven was severely affected and was in the hospital for days. I can recall, as if it were only yesterday, going to the hospital rooms to talk with those seven people and their families. As the leader of the plant, I represented to them the responsible Dow leader, responsible to assure that our plant operations are safe, for our own employees, for our contractors, and for our communities. The impact on me was profound! I made the commitment then and I renew it each year that safety is, in fact, the top priority, as we build and operate our plants – and that this standard of operation applies every place we do business in the world.

From that time forward, I knew I never wanted to be in a similar position again and I also learned a valuable lesson about safety – it's very personal. We all want to return home to our family and friends at the end of each day, in the same condition in which we left for work. It's obvious that's your desire also; why else would we be here at this conference?

On a personal level, I understand this -- and Dow understands this, which is why we consider it a privilege to be allowed by local communities to establish our businesses and to operate our plants in countries all over the world. As an industry and as a company, we serve customers, shareholders and employees, and we also serve our communities and society, on many levels but most importantly through the products we make (which are essential to our way of life) and by the way we conduct our operations. It is our belief that the world can and should be better because of our presence. Our challenge – yours and mine – is to think about how the world can be better because of our presence.

What can (and should) we do differently to make sure that statement is true? I'd like to explore that today.

A good place to start is reminding ourselves of the value we contribute, as an industry, to society. Dow's mission is to constantly improve what is essential to human progress by mastering science and technology. That word "essential" is critical to our mission.

We also see that theme repeated within the chemical industry as part of the ACC's "Essential₂" campaign. We can all be proud, as an industry, and as individuals, of our essential contribution to the world. Collectively we are part of a \$1.2 trillion industry, and we contribute to the world's economy with products and technologies that are present in nearly every facet of society. It's amazing to consider that chemistry touches 96% of all manufactured goods and accounts for 26% of the gross domestic product in the U.S. alone. In short, we are an ENABLING industry, necessary for today's standard of living.

Dow believes we must view our industry through the lens of sustainability if we are going to be successful, and we have believed that for a long time. As an example, in 1996 Dow established our 2005 Environment, Health & Safety Goals. Our objective was to improve safety performance, enhance environmental performance and at the same time

increase productivity. The goals were clear, simple and aggressive: achieve breakthrough reductions in all categories including 20% reduction in energy intensity, 50-75% reduction in emissions, and a 90% reduction in injuries and illnesses, all by 2005. The ultimate vision is zero: zero injuries, zero incidents and zero harm to the environment.

I have something I'd like to show you. It's a short video that explains our philosophies as a company and our efforts to work toward that vision of zero I mentioned earlier. It's only about 2½ minutes long, and I think you will enjoy it.

You may have noticed a mention of our next set of measures, which we are calling the 2015 Sustainability Goals. These goals build on the accomplishments of the 2005 Environment, Health & Safety Goals, but have a broader external focus: strengthening our relationships with the communities where we operate, continuing to improve our product stewardship and innovation, and reducing our environmental impact.

We believe in emphasizing the importance of the chemical industry to our modern way of life. Our focus is on "doing more good," rather than "doing less bad," and it's on being more diligent in our efforts to make sure the good we are doing gets even better. But, to earn the right to focus on the "good", we need a foundation of excellent performance in the area of process safety. This applies to all of us in the industry, as well as for us as a company. Our focus again is to "Drive to Zero".

For example, when we established our 2005 Goals in 1996, we wanted to reduce our process safety incidents by 90% in 10 years. Think about it – 90%. How did we do? Well, we didn't hit the target – we actually came closer to 70% -- but by any measure this is phenomenal progress. Had we not set stretch goals, we would not have achieved this much. *The real breakthrough was in thinking beyond incremental improvements. To get to a 90% change (that is, a step change in results), we needed to think about new strategic approaches to process safety. And this is where I would challenge each of us that is here today.*

These results have been possible because of our strong culture of focusing on process hazards and paying attention to the fundamentals. This is the first major topic I would like to review with you – establishing a sound process safety program.

Like you, Dow pays attention to this every day. Let me give you a few examples. I know all of you could share a similar list, so my hope is that there's a gem in here somewhere that can be a worthwhile learning point for you.

Let me start with the basics. For us, effective process safety begins with the design and control of the facility. For each of our major technologies, we have 25 Global Technology Centers – most of which are aligned to a dedicated process technology (for example, Ethylene, Polyethylene, etc.). Many of you are likely to have a similar organization. The primary role of a Technology Center is to ensure that plants are designed, operated, and maintained for safe operations.

Linked to these Technology Centers, we have a Chief Process Safety Engineer, about 30 full-time process safety professionals, dedicated analytical research roles for our Reactive Chemicals Program, and many, many more people who support process safety activities as a significant part of their job. When each of these roles is considered, it amounts to a great deal of emphasis on process safety.

Our employees use as their guide an extremely comprehensive set of internal process safety standards which we call our "Loss Prevention Principles." These standards contain more than 2,500 separate recommendations or mandatory requirements for our production plants. We apply these standards at all of our plants, including those being built in emerging economies. And we use a number of risk assessment tools related to process safety as we do our plant design work.

Another key part of our Process Safety Program is the assessment of the people running the plants. When a new leader arrives in the plant, we perform a "New Leader Review" within the first six months. In that review, the person must demonstrate in-depth knowledge of the reactive chemical and process safety hazards present in that plant.

What's more, we continuously track our performance for each plant, site-by-site, and business-by-business in terms of the number of process safety incidents, the number of any form of leaks or spills, and the number of reactive chemical incidents. That is all part of the foundation of Process Safety.

We build on that good base with process automation. We have made great efforts to incorporate state-of-the-art process automation and safety-instrumented systems into most of our plants – including the older facilities that were originally built with less robust technology. This has not only significantly improved our safety performance – but it has also improved our plant reliability, operating efficiencies, startup times, and asset utilization.

Finally, we are very deliberate on assets that become part of the company's asset base through M&A activity. We use a very thorough Due Diligence process as a part of our M&A decision making. As a part of our M&A decision making, we include in the economics the projected costs to bring acquired assets to Dow standards. And, our integration plans include the projects needed to assure we can operate consistently with Dow standards.

So, you can see our systems and controls are robust, like many of yours are, I know.

Despite all of this and our years of experience and effort, we must be vigilant, always. Every year brings its own new challenge.

Even today, as the US Gulf Coast recovers from Hurricanes Katrina and Rita, we are facing new safety challenges in our plants due to inexperienced people, especially contractors. The high demand for contract labor in the region has dramatically increased turnover of workers – leaving all of us with the increased risk of inexperience. We must

manage this through additional training and excellent on-boarding of less experienced contract workers, as well as new contractor companies, to assure we are not naively assuming the level of skills and knowledge is at the right level.

All of us in this industry are aware of the potential of a *big* incident. If the programs outlined earlier in my talk are fully implemented, the likelihood is small that a truly catastrophic event will occur. But we must never rest easy. We must assure that implementation of our documented programs are actually a reality in the plants. Based on work done by the U.S. Chemical Safety Board, this is seen to be a potentially significant issue in our industry. And, as an industry, we must be alert to this.

A second major topic related to process safety at the top of our minds is chemical plant security. 9/11 was a U.S. event that changed the world. I know many of you subscribe to the tenets of Responsible Care[®]. Since September 11, we have been working closely with others in our industry to establish the Responsible Care Security Code to help address the post-9/11 environment. Part of that Code calls for assessing vulnerabilities at every one of our manufacturing sites, which we have done globally. We are now on our second round of assessments. I hope each of you is doing that also.

As a result of our Security Vulnerability Audits, we have permanently heightened security by investing tens of millions of dollars in upgrades at all of our locations worldwide. And, we have made sure that our process safety professionals are working arm-in-arm with our manufacturing site security people on assessments.

On the point of security and the linkage to process safety, I'll note that we, as a company, support the need for national regulations that are risk-based and that establish minimum security requirements for all chemical companies. We recognize that a successful terrorist attack on any chemical facility will reflect negatively on the entire industry. Therefore, we believe that it is important that all companies step up to the plate and implement appropriate security safeguards at their plants. For example, Dow uses risk-based assessment methods developed by the National Sandia Labs, which is consistent with the Security Code of Responsible Care. We believe that the only way to assure a minimum level of safeguards exist across our industry is through a regulatory approach.

One topic that is often debated regarding chemical security regulation proposals is the implementation of "Inherently Safer Technology." Being in this room of recognized global experts in the field of process safety, I recognize there are many here who embrace the underlying concept of Inherently Safer Processes and Technologies.

Dow is also a strong proponent of the use of safer processes as we build new plants and throughout the life cycle of the plant. However, like most of you, we do not believe it is appropriate to prescriptively regulate the technologies that companies use through chemical security regulations.

We believe every one of us has a responsibility, as part of the chemical industry, to champion the use of safer technologies. The process design of each plant or product value

chain should maximize the use of the principles this field has created to operate safely (e.g., minimization of storage of hazardous materials, substitution of highly hazardous materials, etc.). One of our objectives should be to implement the technology changes based on risk such that there are no unmitigated chemical-related incident scenarios which can result in serious injury or fatality. As an industry, we have a commendable track record in continuously upgrading to safer processes, and we'll continue to work on this issue.

So where has all of this focus on effective process safety gotten us? I know all of you could stand where I am and give your own examples of the benefits you have achieved. We believe it has more than paid for itself. In 2003, the CCPS published the business case for Process Safety. The benefits are clearly outlined in that study. Safe and reliable operations, higher earnings per share, better employee morale and loyalty, better attraction and retention of people, enhanced corporate image, greater market share, license to operate ... just to name a few. Most importantly, our employees go home at the end of the day in the same condition as they left for work.

But the realities of the world still exist. Competition is tough. Globalization is moving us closer to a single world market. Customers are more demanding. GDP growth in China, India and other emerging economies is exploding and high energy costs look to be a permanent part of the global landscape.

We do not expect these factors to change, and we want to be part of the exciting growth in chemistry all over the world. Effective process safety will assure that we can get our seat at the table and keep it. We know that if our reputation on how we operate is good, communities will welcome us. That's our aim.

And, as we invest in emerging economies around the world, the industry's reputation is either helped or hurt by its performance in the area of process safety.

This brings me to the third major topic – how we design and operate our plants in emerging geographies, and how we leverage our industry knowledge to small companies.

If you are not sure where to begin, think about your company, your peers and competitors. I'm sure you see, as I do, the tremendous need to leverage process safety best practices from company to company, including large to small, and from industrialized nations to emerging economies. This is a role CCPS and its members can take on, and incidentally, where we can all make great contributions.

It goes without saying that we, as individual companies, must implement the very best process safety standards and practices as we all expand into new geographies and take advantage of the benefits those geographies offer.

Although developing countries may not currently have the same regulatory requirements and litigious practices in place today as in the U.S., these developing countries are aggressively leveraging tough regulations and standards from other countries or

international standard writing organizations. In effect, their regulations may leap-frog other countries by adopting the most stringent requirements from other countries.

Many of us believe that developing countries will increase their level of compliance enforcement and adoption of "recognized and generally accepted good engineering practice" from other countries. Applying process safety best practices in emerging geographies is best done, as we all well know, at the initial design of the facility. And, I believe, this is the position each of us, as companies in this industry must take as we design plants in the emerging economies.

As for small companies, statistical analysis from the U.S. Chemical Safety Board shows that of the 600+ incidents reported to the Board each year, over 60% happen at facilities with fewer than 100 employees, and over 80% occur at facilities with 500 or fewer employees.

Why is this? Some potential reasons that have been proposed include the view that small business owners may not be technically educated or trained. They may not see themselves as conducting chemical operations even though they may react chemicals in their processes to produce products. They, therefore, may not pay much attention to the hazards produced in their processes and in the handling of chemicals. There may not be any incentive to run a better managed business, in the area of process safety, as some regulations exempt them, and OSHA and EPA and State agencies seldom focus on small businesses until an accident happens. So, affecting a change in this area is a challenge the larger firms in our industry need to consider in their relationship as a customer or supplier company, to help educate them about the benefits of process safety management and preventing chemical accidents.

We can and must leverage our expertise in these areas because, as you know too well, we all face the same negative consequences in terms of industry reputation and additional regulatory burden when that one *big* event occurs.

So, to summarize, if you already have good practices in place, challenge yourselves to get better. What could you do differently? How could you improve? What will it take to get to zero?

Think about security in the context of the entire industry. If there's an incident anywhere, it impacts us everywhere. We must remember that as we share our ideas and resources with each other. As an example, large companies can especially work with smaller companies, – which are involved in over 80% of the process safety events that are called into the U.S. Chemical Safety Board – to elevate the entire industry.

We are an enabling industry and collectively we make products that enhance the quality of life. This is an undisputable point. The American Chemistry Council has some great information on its web site about our essential impact. Review it, share it, be an ambassador for the industry. But, as stated earlier, our record on process safety must be flawless for the good we do to have credibility.

Together we can continue to innovate to improve safety, to assess new security challenges, to share best practices and be diligent in our own efforts to operate our plants safely. And it can all be done in the context of building a stronger, more sustainable chemical industry and a better world.

We *are* vital to our nation's manufacturing sector, the economy, and our communities. We *are* vital to the growth and development of emerging economies. It *is* personal, and we *are* essential to life. Our focus on process safety can reflect that value.

Thank you for your time and attention.