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New England Pipeline Safety Seminar

NEPSR, USDOT, PHMSA

I appreciate the invitation to join you today. I welcome you to Maine and based on the agenda expect your time will be profitable. As you all know the advent of shale gas extraction in the United States is changing the energy landscape in North America. Marcellus shale gas is pushing back supplies from many other producing regions leading to flow reversals on many pipelines and a new way of viewing our energy future. This resource, and what it represents an abundant, clean, cheap energy supply is driving capital investment decisions regarding energy intensive businesses and providing regions that have access to the supply a competitive energy advantage.

Here in Maine we have seen significant build-out by the State's local distribution companies (LDCs) to bring the natural gas option to large industrial clients and residential homes along the route to these anchor customers. These developments are extremely positive for Maine consumers and Maine jobs. While some of that build-out has slowed in the face of low oil prices in time it is likely to pick-up again, based on the underlying economics and the environmental attributes.

However, it is at the very moment when, as now, we are in a build-out atmosphere that it is most important for all of us to pause and recognize that the future and success of natural gas in the region depends, first and foremost, on the public's trust and confidence in the safety of the natural gas transportation system. In a sense it is public perception which grants utilities a social license to operate in the region. In Maine the Commission's very authorizing statute places safety first. Section 101 states "The basic purpose of the regulatory system is to ensure safe, reasonable, and adequate service...at just and reasonable rates." If we treat safety as either a foregone conclusion, or an afterthought, we will have failed to satisfy our core responsibilities and will have violated the social contract by which we license natural gas transportation systems to deploy capital for a public purpose. Let me be perfectly blunt: more than capital, price, and

the promise of economic development opportunities, it is the guarantee of a safe pipeline system that is a prerequisite for the continuation of any license to operate.

My formative years as an engineer were spent in the Navy's nuclear propulsion program NR (Naval Reactors). If there is an organization that epitomizes what it means to mainstream safety it is the NR program. What do I mean by "mainstreamed safety"? "Mainstreamed Safety" is what the former director of Naval Reactors (NR) Admiral Bowman described in his testimony to Congress following the Space Shuttle Columbia tragedy¹. Mainstreamed Safety means that the role of safety must be part and parcel of everyone's job – extending from deck plates to Head Quarters (in our case from the trenches to the boardroom). So understood, safety as a primary mission doesn't reside simply in some particular working group displayed on some organizational chart whose reason for existence is stated in terms such as "the promotion of safety in our organization" instead, safety must be mainstreamed – it must be a critical component of every daily function performed by every worker and manager at every level of the organization and beyond the bounds of the organization described by the typical org chart. This means that safety is equally part of the responsibility of every supplier, and contractor and that it extends to areas such as training, construction planning, hiring decisions, engineering and design considerations, and how quality assurance is approached in all of these activities and by all of these actors.

The necessary approach to Gas safety is, to my mind, more similar than it is different from nuclear safety. The fundament goal of each is to eliminate low probability of failure occurrences. Why do I say "eliminate" rather than "reduce the likelihood of" failures. It is because the result of a failure could be catastrophic...low likelihood of failure, high impact. This is not portfolio theory – we are not applying a beta "risk factor" to maximize likely returns at some predetermined level of acceptable risk. This is about ensuring the safety and preservation of more than investment capital – it is about the protection of human life and of property. Avoidable risk due to not meeting the minimum federal safety standards is unacceptable.

¹ See testimony, <http://www.navy.mil/navydata/testimony/safety/bowman031029.txt>

In the navy nuclear world, decisions are made based on a cradle to grave view of the technology used to build a project. All decisions are made for the long haul. A given class of ships may, and likely will, be in service for 50 years. The same long-term view applies to natural gas infrastructure. Pipe that is put in the ground today is likely to be in service 50 years from now. And if we are investing in and building new infrastructure that is going to be around for the long-haul, we must ask: what is it that, at a minimum, we should know about that infrastructure today, as it is being placed in the ground? At the very least we should know the precise physical location of the infrastructure that we are installing and we should document those locations. GPS is not a new tool, and we must use it. For each piece of pipe laid in the ground, we must also document the type of pipe installed and the fittings and joining methods used to connect each piece of pipe. And again, we should document the location of each of those fittings, before the trench is closed. Why is this important? Because we will inevitably learn, over the course of the coming decades, about a class of pipe, or a class of fittings, or a joining method which is starting to experience problems in the field. In the 70s and the early 80s, safety bulletins started coming forward on stress cracking of plastic pipe at joints and other points of stress. Plastic pipe companies responded with new resins and improved resistance. LDCs responded with replacement programs. We are all familiar with the ongoing issues around the country associated with cast iron pipe. Cast iron pipe was the state-of-the-art material, at the time of its installation (over 100 years ago to as recent as 50 or 60 years ago). It's now leak prone due to its bell joints, small diameter pipes are susceptible to brittle cracking, and graphitization of the cast iron occurs in certain soil conditions. More recently, issues emerged with mechanical couplings like the Dresser fittings in the 80s-90s that did not have adequate restraint on plastic pipe and led to catastrophic failures². What might we read about 10 years from now concerning our current practices? Maybe nothing, but more likely, weaknesses will be found out and new materials and techniques will be developed and adopted to ensure safety. Based upon these past experiences, of which a prudent manager of a natural gas transportation system must undeniably be aware, and the all but inevitable fact that weaknesses in current materials and practices will be discovered over time, a prudent manager of a natural gas utility installing long-lived

² PHMSA-RPSA-2004-19856 Pipeline Safety: Issues related to Mechanical Couplings Used in Natural Gas Distribution Systems, See NTSB Pipeline Accident Report National Fuel Gas Company Natural Gas Explosion and Fire Sharpville, Pennsylvania Feb 22, 1985

infrastructure must anticipate the future by conducting current build-out in a way that facilitates future necessary remediation requirements even while the contours and particulars of such remediation is presently unknown. To act prudently today, a gas utility needs to know, today, and with a specificity focused on current and future safety, what it is installing, where it is being installed, and how it is being installed.

When we do encounter technical problems – as history proves that we inevitably will -- how do we seek to address them? Having been on the operations side of the nuclear navy I can tell you how Naval Reactors personnel approached seemingly small problems. They asked all of the hard and difficult questions on every issue...including the seemingly mundane ones. What actually happened; ie. what are the facts? How do you know this is what happened ? (was it a visual inspection/NDT/instrument readings/etc)? Who is the responsible party ? Is it a vendor/a contractor/our inspectors/our technicians? What could be affected? Not “what will likely be affected,” but what *could* be affected. Do we have other instances of this particular event, or other analogous events? Is this a condition that is outside of our design expectations? What is the worst possible outcome/failure modes? Now why is it important to ask the hard questions on the small and mundane issues? It is important because solving technical issues related to small problems prevents them from growing into bigger problems. It trains your organization not to accept and live with small problems. How many times do your technicians walk by small problems? Is their reaction, “Oh, it has always been this way?”, or “that valve has never operated correctly and we will get to it sometime....that pressure relief usually needs to manually reseated”and the list goes on. It is attention to detail in the small things that is a barometer of the overall health and efficacy of an organization as a whole and of its management. As Admiral Rickover so aptly pointed out:

“Any one detail, followed through to its source, will usually reveal the general state of readiness of the whole organization”.

As the regulator charged with overseeing gas safety for the state of Maine I have a limited staff, a gas safety manager, two inspectors, along with administrative and legal support. They are a great team, to their credit they received a perfect score on their latest PHMSA audit (2 years running). Our inspectors are in the field almost every day. They see a very small percentage of

your organizations and their operations. They look for details and follow them through and I believe this gives us a pretty good idea of the general state of readiness of your organizations.

Safety, in my mind, boils down to a sense of ownership and responsibility. The ownership and responsibility in each LDC organization must extend to contractors and suppliers. How do you push a sense of ownership and responsibility down the chain? You do it by holding individuals accountable to high standards. There is no secret here as with most things in life it comes down to people. How do you as an organization screen the people that you hire?

(Adm Rickover, the father of the nuclear navy, in building the program understood that to develop the workforce culture that was necessary he needed to diligently screen those he brought in...and he sought to bring in young talent that he could mold...he wasn't interested in transfers...instead he personally interviewed everyone. NR has continued that policy everyone does a face to face with the Admiral, quite a day when lowly Midshipman Vannoy went to his interview at NR HQ in Crystal City with Adm DeMars something you never forget...this is a 4 star admiral...a midshipman thinks a Lieutenant is lofty. As the interview started I saw the Admiral scanning what looked like my transcript...my heart took a bit of a lurch because I knew there was an outlier on that sheet of paper...his eyes stopped moving down the sheet and I knew he had found it...at that point he looked up and asked "why should I let you in the program how do you explain the D you received during your first semester of electrical engineering?" I knew at that point that the 4 basic responses you are taught during plebe summer were not going to cut it. "Yes sir, No sir, I will find out sir., and No excuse sir". Although in answering I do think I led with no excuse sir...the rest was a blur but in the end he did let me in the program and 5 years later after completing a sea tour operating a nuclear reactor I was back at headquarters in Crystal City for two days of nuclear engineer exams which I passed and was certified as a Naval Nuclear Engineer.) The point in this aside is: are you doing the due diligence on the people you allow to construct and operate your system? You must because they are integral to the quality of the system. The quality of each joint in the field comes down to sub-contractors taking ownership and responsibility for their work, gas utilities must foster that ownership and responsibility, that mainstreamed safety, with their vendors.

I challenge you all in whatever role you play in the gas and propane industry to hold your employees and contractors accountable in the details. This brings us to the concept of

responsibility. Who is ultimately responsible and what does responsibility look like? It is worth thinking about...

Responsibility:

Admiral Rickover, in establishing the construct of the NR program, realized the importance of putting total responsibility in one place. I quote: “Responsibility is a unique concept: it can only reside in a single individual. You may share it with others, but your portion is not diminished. You may delegate it, but it is still with you. You may disclaim it, but you cannot divest yourself of it. Even if you do not recognize it or admit its presence, you cannot escape it. If responsibility is rightfully yours, no evasion, or ignorance, or passing the blame can shift the burden to someone else. Unless you can point your finger at the person who is responsible when something goes wrong, then you have never had anyone really responsible. “

Each of you in your various organizations is responsible for the safe and reliable operation of your gas transportation systems. As the Chairman of the regulatory organization in Maine entrusted with the oversight responsibility for ensuring that your licensed organizations are operating your infrastructure safelyI will endeavor to hold you accountable in a fair, impartial way, to the minimum safety standards outlined in both rule and statute. Ultimately though the responsibility and ownership associated with providing safe and reliable service lies with the regulated community. This is a serious responsibility. It is the very essence of what it means to be a Public Utility -- to be granted the authorization by the State to place infrastructure into the service of the public. Shouldering this responsibility and discharging it faithfully each day ensures the social license necessary to continue bringing the benefits of natural gas distribution to the people and economy of Maine and to your respective New England States.

Thank-you for the opportunity to speak today and for your kind attention.