I am Martin Garvey, and experimentation integrator at NATO’s SACT HQ. My job title doesn’t tell you much. My job is primarily to develop ways to examine new concepts by applying them to operational conditions or circumstances using scientific methodologies to see if they solve the problems they are designed to address – or to assess new capabilities & identify the requirements needed to fully implement those capabilities. In reality besides my normal functions I have and continue to actually write concepts, act directly as an experimenter and do analysis.

I am sorry I could not join you in person. I am currently in the Netherlands working a ballistic missile defense experiment. My portfolio includes BMD, Countering Improvised Explosive Devices (C-IED) and all aspects of Maritime Security. I am also currently supporting an extended field trial on the detection, ID and control of radiological/nuclear (R/N) materials in the Maritime Environment. This trial is focused right now on what the command and control requirements might be for NATO should the Alliance decide to take an active role in this aspect of R/N counter-trafficking.
Outline

- What is the Problem?

- What can we do (technical art of the possible)?

- What is missing?

- Next steps
The challenge for halting the flow of proliferation material and technology, and keeping them out of the hands of terrorists and rogue nations, is daunting, as you can see from this depiction of global sea-routes. More than 90% of international cargo moves by sea. Vast areas of the world's oceans are unmonitored. 10% or less of shipped cargoes are opened and inspected when in port.

As most of us know, in early 2004 the world learned that for more than 15 years, Dr. A.Q. Kahn, the chief architect of Pakistan's nuclear weapons program, and his global network had been selling nuclear weapons technology and equipment on the black market to North Korea, Libya, and Iran, using components obtained in Europe, Dubai, and Malaysia. His activities were probably only the tip of the iceberg.

We know from open sources that there have been hundreds of cases of illicit trafficking of special nuclear and radioactive materials over land. In a 2006 report the IAEA said there were 103 confirmed incidents just in 2005. If this is happening over land, I am sure you would agree that it would be naïve to think this is not occurring at sea where international waters are all but unregulated and there are no strong international legal regimes to support
enforcement actions. In last year’s IAEA report, that organization stated that 113 nations were engaged – either knowingly or not – in proliferation. Most if not all of the reported intercepts were across land borders. In recent discussions the staff of HQ SACT had with representatives from the USCG HQ, the focus of the Coast Guard was shifting to out-going materials; leaving the job of monitoring in-coming goods primarily to customs. This tends to reinforce the IAEA findings.
NATO and several Nations have been conducting trials for several years on new or better ways to detect the presence of containerised and/or shielded chemical, biological, radiological and/or nuclear materials. There is not now, nor will there probably ever be a ‘silver bullet.’ Success will almost certainly be tied to a highly integrated and overlapping architecture of detection methodologies and – probably most importantly – proactive information sharing.

Here’s today’s technical bottom line: it is possible to detect the presence of – and identify – radioactive source materials through containers, bulkheads and/or shielding; either using mobile detectors mounted on a small craft, on while on board a ship at ranges that keep personnel safe from high radiation doses without really having to deviate much from their normal boarding practices and procedures. The same cannot be said for containerised chemical or biological agents or constituents. Even though R/N material can be detected and ID’ed, that doesn’t mean much.

I have a long list I compiled on my own of common commercial and industrial items that contain radioactive isotopes which I have provided to Dr Bergeron electronically which I would encourage you to look over. I’ve matched my list,
and it compares very well to a similar list compiled by Savannah River Nuclear Laboratories for the USCG. What you will find is that radioactive isotopes are ubiquitous. So, just looking for R/N material is not enough – we will find it all day long. It is (a) the decision-making processes and (b) information sharing that are proving to be the big problem areas. A danger is only obvious if SNM is detected, like plutonium or HEU. Otherwise, judgement and the use of other indicators are necessary for a boarding officer and his reach back support to determine if a detected source is in some way unusual – which may indicate it might be used for something like a Radiation Dispersal Device – RDD or “dirty bomb.”

Another area of concern are items designed to support uranium enrichment or the manufacture of WMD components. Some of these are specialised, others are what are often called ‘dual use.’ However, being able to discriminate between these items and absolutely innocent similar items takes a good deal of training and good intelligence. This kind of detection can only realistically happen at loading and unloading inspection points. At borders, customs, law enforcement or military boarding teams will rarely have the required training – or if they do receive the training can they retain the skills – to be able to spot these non-radioactive items. Even if all that were available, access to (especially) containers on a ship while underway is a difficult and dangerous process even if the weather is perfect.
There are a lot of international efforts focused on – or with an interest in - stopping terror-related illicit trafficking. Not all of these efforts or organisations are confined to Nuclear terrorism or proliferation. Some are truly international, some are bilateral or regional, some are NATO – or run by a coalition of the willing, and some are purely National efforts. Some are primarily military, while others are purely civilian. Additionally, there are enabling things like NATO’s developmental Maritime Security Support Information System (MSSIS) that look at non-military shipping and smaller vessel tracking, or NATO’s Shipping Centre & the Maritime Security Centre for the Horn of Africa which are currently focused on counter-piracy operations in that region.

The point I am trying to make here is, that there is a lot of work going on – and more importantly a huge amount of information is being collected and assessed – but there is no coherent framework, architecture, plan – call it what you may – in place so that all this information can be stored, shared and analysed in any systematic way that would support what I assume is a common desire to stop the proliferation and trafficking of the world’s most dangerous weapons and substances to the world’s most dangerous people. And there really are some surprising holes or inconsistencies in the quantity,
quality and type of information available depending on who you as a Nation or organisation, are.

Let me try to make an additional point. There is no, nor will there be, any single technology or process that can be followed that will detect the movement of all – or even any – CBRN materials, their means of delivery or of dual use items by sea or in the maritime environment. Success in this area will always be – and believe me as an experimentation professional by trade I hate to speak in absolutes – but there will always be a need for a system-of-systems and system-of-processes approach. To me that means layers of a variety of sensor types, screening and analysis processes and information collection techniques in land transportation, at ports of lading, at ports of disembarkation, on the high seas with maritime law enforcement or Naval forces, together with complete electronic cargo manifesting that is compliant with a specific database schema to support analysis.

So, what am I trying to get at??
Collaborative INFORMATION exchange and management I believe will be one major key to success. NATO learned a lot during ISAF operations in Afghanistan about information sharing – not only between alliance members, but also with coalition partners. You have to remember that though NATO started in the 40’s, Afghanistan and OPERATION ACTIVE ENDEAVOUR in the Mediterranean were the Alliance’s first ‘boots on the ground’ Article 5 warfare operations since the end of WWII – so we’ve been practicing for a LONG time, but these were the first real applications.

So, one of the things NATO learned can be packaged as the Afghan Mission Network or AMN. For part of that network, NATO set up a knowledge repository. Membership in the AMN was based on sharing – if you want access to the information in the network, you have to provide & share information into the network. All kinds of information was placed into this repository by the coalition partners. However, use of certain types of information by specific countries or national entities – law enforcement for example – was and still is constrained by each nation’s laws, etc.

So, what NATO did was set up a structure – in this case the repository – set up the technical formats and protocols the participants would use to put in or remove information. The Nations for their part shared information into the
repository. Each Nation could set up its own protocols for what information it would extract & for what purpose. So basically, NATO set up the architecture, set the rules and managed the network. And in the case of this repository, the Nations and the ISAF command staff pushed and pulled the information they desired.

**Give DEU example on constitutional restrictions on military information for civilian prosecutorial use.**

What I have just described is one of the strengths of the NATO alliance – standardization and information management. There are a lot of weaknesses as you can imagine with an alliance of 28 Nations requiring consensus – but interoperability and usability of disparate information sources is one thing NATO does very well indeed. And since NATO is not a country, certain issues related to one Nation or another are much less of a problem.
One thing the US and NATO have in common is a technique called System of Systems Analysis, or SoSA. In brief, it is an analytical technique that systematically looks at the political, military, economic, social, infrastructure and information (PMESII) aspects of an area of interest and develops systems and network diagrams of each. They then look at system vulnerabilities, adaptability, etc to find those nodes within the system where some type of action or activity might garner the most positive effect on the whole system, while mitigating the inevitable negative effects. Besides trained analysts, NATO has software and other processes that make this a very effective tool for those just maintaining situational awareness, looking for Indications & Warnings, and for those monitoring on-going operations. This particular eye chart examines the economic system within Guinea – part of which shows the inter-relationships with smuggling networks in both Guinea and Sierra Leon.

As you can imagine, when you combine these various network diagrams geographically or in other ways, it is a good method to gain a broader understanding of a complex environment. These techniques can be, but at least in NATO have not yet been, applied to identify and define illicit trafficking networks, but are a perfect tool for just such work. These
networks are not only a concern because of CBRN/WMD trafficking, but include weapons trafficking, smuggling of components used to build Improvised Explosive Devices (IEDs), human and narco-trafficking. These networks are generally regional and have varying techniques and capabilities to move different items. If you combine that knowledge with other intelligence or information that illicit WMD materials are moving & where, you begin to have the means to somehow disrupt that movement somewhere along what we call the incident chain – between the financing, movement, storage, assembly, deployment and final employment of a weapon. The Counter-IED guys have had successes using this methodology in Afghanistan, and there’s not reason it cannot be applied to other domains & threats.
Here are my final thoughts – and it is aimed primarily at industry; shipping companies, underwriters, companies that run port facilities, manufacturers that rely on international trade; but also at national customs agencies, the WCO, the OSCE Border Security group & others.

Look at this picture. It is probably a matter of when….not if. Think back on that slide I showed you with the alphabet soup of all of those initiatives, PSI, CSI, GCINT – on and on. Some of those initiatives and agreements are multi-lateral, others are bilateral. What survives when the unthinkable actually happens? How many countries ship and receive goods by sea? If you know the answer to that, you can pretty easily predict how many different shipping regulations will be put into place the day after something like this occurs regardless of WHERE it occurs – and I think we can all also predict what that means for global commerce for no short period of time.

BUT, there may be something industry might be able to do to get in front of this particular catastrophe.
The one thing that IS truly global is commerce. The sellers, the shipping companies, those involved with port security & screening, underwriters – are the constant. If those entities team to develop standards for manifesting, random open & inspection, radiation and x-ray screening among other things, could only have a positive impact. And those activities could come with concrete incentives: underwriting fees for example, could go down since risk is reduced.

Remember my previous slide. There is no common global standard now – and if catastrophe strikes there will be literally hundreds of disconnected and uncoordinated national responses that will stop global commerce cold. In many ways an régime set up by industry in partnerships with nations – based on the bottom line – may have a better chance of success than if similar things are attempted using purely political means.

Let’s carry this just a little further – and you the audience are more expert than I am on these larger issues, and I do not intend to teach grandmother how to suck eggs – but I would like to tease you with some final thoughts. If a certification regime for carriers, port facilities, etc could be agreed by industry & monitored by a trusted agent – for example the WCO or some
such organisation – then might it not be reasonable - if nations want the enhanced security such a regime provides – to provide accelerated or preferred customs clearance to those goods coming into their ports, giving those companies who comply a way to get their goods to market faster – or maybe at some lower level of duties? And if ships use compliant/certified ports and therefore get preferential treatment or save money, then does that provide an incentive for non-compliant ports to strive for compliance/certification or face the loss of competitive advantage?

And for those who remain stubbornly non-compliant, would that not give law enforcement, boarders & customs and intelligence services places to focus their activities?

I could go on and on – as Dr Bergeron will attest. My point here is that industry – commerce is the common global thread. They can create regimes and plans that you can then present to the maritime nations as a coherent package. Getting agreement would not be easy – far from it. But I submit it would be far easier, more cost effective for all involved, and much easier to amend if something did happen than if everyone just waits for catastrophe to strike.
I’ve thrown some things at you and strayed somewhat from my purely technical mandate – things you know & probably nothing really new though the packaging might be different. The technical ability to detect, identify & control the movement of illicit R/N materials is there; we can do it today. BUT, without centralised information exchange, coordinated and shared analysis and coordinated common action, the goals of EFFECTIVELY countering the illicit trafficking of R/N materials or WMD is unlikely to be realised.