

**SPILLCON 2004 – PARTNERSHIP IN PRACTICE**

**CHEMICAL SPILL PREPAREDNESS**

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Let me open this address by painting you a picture. Lets imagine that as we sit here our mobile phones start ringing and text messages start appearing. All the bells are ringing and the sirens are on.

### **Situation**

Friday 13<sup>th</sup> at 1530 hrs and its the beginning of a long weekend.

Smoke is billowing from the aft end of a chemical tanker at No1 Maribyrong and she is half way through discharging her cargo of 8,000 mt of benzene and 1000 mt of acrylonitrile.

Cargo operations have been suspended and fire fighting commenced from the jetty whilst awaiting a report on the source of the smoke, emergency services are en route including a full chemical response team, fire fight tugs have been called and all non essential staff ordered to leave Coode.

The first reports arrive that a serious fire has developed in the engine room of the MT Bug Bang (for the Kiwi's out there). The crew has shut down the engine room and is preparing to release CO2 in to the engine room. The ship is now immobile and the engine room temperature continues to rise with paint blistering on the ship hull above the waterline in the area of the engine room. Smoke continues to envelope the accommodation spaces and the master has ordered all non essential fire fighting crew to evacuate the ship.

Lets stop and think about this for a moment.

- Could this happen in Australia?
- Are we prepared to deal with an incident like this?
- If we are not prepared, why not?
- What do we have to do to be better prepared?

In considering this scenario the relevant location of the ship, close proximity to a major CBD, essential port infrastructure and a busy traffic route. Then what are the options with the ship in this condition? Tow her out under the Westgate Bridge to remove the potential explosion threat, take her to a remote part of the port where would that be? The port and community environment has changed around a complex that once was considered to be in an isolated industrial area. Ports and the general community interact more today and it is now seen as trendy to live near port activities. Have we considered this in our planning?

The scenario is based on an actual incident the Panam Serena that I will review later in my address.

Partnership in Practice, the theme of Spillcon this year is very relevant to the chemical transportation industry. There is a lack of understanding of the industry in general and through the development of partnerships with all stakeholders we will be better prepared.

Chemical Spill Preparedness is the title of my address.

- With an increasing focus on the transportation of chemicals in the region
- the Capability of industry and all its partners to respond to a major chemical spill
- In this region can only be achieved by partnerships between all industries
- Members including state agencies, federal agencies, ports, ship owners,
- customers, storage facilities and other related parties.

It is my view the industry needs to look internally to see if we are ready to deal with a serious incident such as the recent Panam Serena case. My instinct is that we are not.

## **THE CHEMICAL SHIPPING TASK IN AND AROUND AUSTRALIA AND NEW ZEALAND**

Chemicals are imported into the region using every mode of transport in the logistics chain. From packaged goods in part container loads through to 50 to 60,000mt shipments in bulk. Every port has some exposure to these activities and is required to have plans to deal with chemical incidents.

Looking at chemical tankers only on a global basis in 2003, approximately 77 million tons of chemicals were shipped. Within the region approximately 4 million tons of organic and inorganic chemicals are shipped annually. The largest single volume being the importation of caustic soda for the alumina industry approximately 2.3 million tons of liquid caustic soda was imported into Australia in 2003 and this volume continues to grow. Other large volumes shipped in the region include, methanol, sulphuric acid, benzenes, ethanol, propylene oxide and a whole range of small volumes in parcel tankers. Many of these cargoes are carried on sophisticated chemical parcel tankers which can be differentiated by their high degree of subdivision via multiple tanks with independent cargo pumps and lines. These ships have the capability to carry many different products at the same time. The ships range in size in this region from 6000 mt dwt to 40,000mt dwt with 20 to 58 cargo tanks.

## **LOCAL TRADE PATTERNS AND POTENTIAL RISK.**

The trade patterns for ships engaged cover most major Australian ports on the east and west coast. With medium range size tankers delivering caustic to, Kwinana, Bunbury, Gladstone and Gove. The passage of these ships around the coast is regular and interaction with all other shipping is continuous. As the trades are port intensive calls are in excess of 700 per annum. The incident level for chemical tankers is low for grounding and collision. There are low margins of error for chemical tanker operations and the results can be catastrophic. There is a high degree of scrutiny of these ships by all authorities and AMSA/MSA assess these ships as high risk. AMSA inspects chemical tankers regularly through port state control and tanker inspections. The industry is very heavily regulated at all levels by international regulations too numerous to list here. Some potential risks are fire, explosion, grounding, collision, pollution and operational pollution through tank cleaning activities as these ships change between cargo programs.

## **PREPAREDNESS**

Words to describe preparedness are readiness, fitness, suitability and capability plus more. In this context the region has not, luckily, had experience in participating in having to deal with a major chemical tanker incident. Government has been proactive in developing planning to increase preparedness in the region and it is comforting from an operational level plans have not had to be activated. Government and industry must therefore learn from incidents in other areas to assess the preparedness of all stakeholders in the region to react to an incident in this region. Due to a very low frequency of incidents on a global basis experience in dealing with serious incidents is also low. The industry has recently, in the last 12 months, experienced a number of serious incidents, involving unfortunately, loss of life, damage to the marine environment and loss of chemical tankers.

Some of the more recent incidents I would like us to review are:

**Sun Venus**, 7,100 dwt, built 1997, off Japan December 24<sup>th</sup> 2003, explosion in one center whilst tank cleaning, 2 crew members died and there was very serious damage to the ship. Photos show the deck was blown up and bent over on to the focsle damaging the main mast etc. The ship was able to proceed to a repair port even in a seriously damaged condition.

**Panam Serena**, chemical tanker alongside in Porto Torres, Sassari, Sardinia, Italy had an explosion on board whilst bunkering and subsequently caught fire on Jan 1, 2004. 13 crew members were rescued and two were reported missing. The Panam Serena was loaded with 8,400 mt of benzene and was discharging at the time. The Panam Serena burnt for 20 hours and then sunk whilst along side. The fire did spread to the shore terminal and the shore terminal burnt for 4 days. The port, a busy ferry port, was closed for 5 days. The Panam Serena was less than 1 year old and the hull was insured for 20 million dollars. The damage to the ship was so severe she was declared a total constructive loss. The deck was opened up from number 1 cargo tank back to number 6 cargo tanks. This has been one of the most serious incidents in a port area.

**Bow Mariner total loss** and 21 lives lost there were 6 survivors. On February 29<sup>th</sup>, 2004 Bow Mariner suffered an explosion and quickly sunk about 50 nautical miles off Virginia on the US East coast in 264 feet of water. Bow Mariner was en route from New York to Texas City with about 11,000 mt of ethanol on board. Ethanol is a water soluble alcohol with a low flash point and is classified as a Marpol appendix 3 cargo. Ethanol is considered to have a low toxicity and its impact on the marine environment is considered to be low. Bow Mariner was a 39,281 dwt product tanker built in 1982. The damage to the ship was so devastating that although relatively close to the coast the U.S. Coast Guard who responded quickly could only recover 6 survivors, 3 seamen were confirmed dead and 18 are missing presumed dead. A US coast guard aircraft managed to photograph the hull disappearing below the waves bow first. Subsequent side scan sonar imaging of the wreck confirms the chemical tanker suffered catastrophic explosions leading to her quick sinking and the small number of survivors.

The operation to locate and recover missing crew from the Bow Mariner and to remove fuel oil ended on Friday March 26<sup>th</sup> with the approval of the US Coast Guard. No bodies were recovered and no cargo was recoverable. An investigation into this tragic incident commenced by the USCG at the request of the Singapore government as the flag state of the Bow Mariner. A full report has yet to be produced and recent reports advise that the USCG has completed a detailed investigation.

**M/T Perla**, a 10,331 dwt, 1994 built chemical tanker suffered a rupture of 2 port cargo tank at deck level whilst loading methanol at Westgate Port Taranaki in New Zealand. A serious rupture in the deck plating resulted and further internal structural damage was found after investigation once the ship had been discharged cleaned and gas freed. Luckily no one was injured, there was no pollution and the incident did not escalate to anything more serious. The New Zealand Maritime Safety Authority conducted a detailed investigation and at the time of writing a final report had not been released as to the cause. This is a very unusual incident that took place in this region.

**M/T NCC Mekka** is a 37,272 dwt, 1995 built chemical tanker which suffered an explosion on June 4<sup>th</sup>, 2004 whilst tank cleaning of the coast of Brazil. Two crew members were seriously injured and both subsequently died from the injuries they received. The ship suffered some structural damage from the explosion which happened in 1 center starboard whilst it was being cleaned. The crew on board reacted swiftly and did an out standing fire fighting job to extinguish the fire quickly and prevent the fire escalating to other loaded cargo tanks. A maritime enquiry was held administered by the Norwegian Maritime Directorate.

**Ena-2** in July 2, 2004, a small specialized German sulphuric acid carrier with 916mt of acid on board capsized after a collision with a large container ship. The master of the ship was found to have a blood alcohol level of 0.021. All the acid was lost and a localized fish kill resulted. The ship was subsequently righted using sheer legs and removed successfully.

## **CONCLUSIONS FROM THESE INCIDENTS**

Apart from where there has been a catastrophic incident the high degree of subdivision of chemical tankers means their serious damage survivability is very high. The incident rate for chemical tankers on a tons per mile basis is very low. The cause of a number of these incidents is from tank cleaning operations. Incidents in port areas are the greatest risk to the communities surrounding those port areas.

Chemicals may have the following characteristics or combinations of characteristics:

- Sinkers – Heavier than water
- Floaters – Lighter than water
- Miscible – those that blend easily with water
- Low flash- Flash point less than 61 deg C
- High Flash- Flash point greater than 61 deg C
- Toxic
- Corrosive
- Odorous
- Poisonous
- Violently reactive to water
- Violently reactive to other chemicals

In addition the products may be carried in a heated or cooled state.

Many parcel chemical tankers will be carrying combinations of products with many of these characteristics on a voyage. There for early assessment of the appropriate response to an incident is critical to incident management.

## **REPAREDNESS OF AUSTRALIA AND NEW ZEALAND TO COMBAT A MAJOR CHEMICAL TANKER RELATED INCIDENT.**

Whilst national marine chemical spill contingency plans have been developed knowledge on responding and managing chemical tanker incidents both locally and globally is low. The frequency rate of incidents is very low and the chemical tanker industry is relatively young, at less than 40 years old. The sophistication of chemical tankers demanded by the trade has assisted in keeping the statistics down. The very tight regulatory environment that chemical tanker operators must comply with has assisted as well in keeping the frequency of serious incidents down. Double bottom has been the standard for all modern chemical tankers and double skin chemical tankers have been built since the early 1970's. The first generation of double/double chemical tankers has already been scrapped. What this means is that the ability for learning by combatant organizations from previous incidents has not been able to be achieved. Therefore links to oil industry preparedness and response planning are the cornerstone of chemical plans. The unique and diversified characteristics of the products carried means the accurate assessment of any incident is critical prior to response.

This is why we are here today to discuss and develop our partnerships so that in practice we are better prepared.

### **POOL OF KNOWLEDGE**

I like to draw parallels to chemical spill preparedness with our preparedness for security issues as indicated by the compliance and enforcement of the International Ships and Ports Facility Security (ISPS) Code. A key element of preparedness under legislation now in force is cooperation amongst all stakeholders in the maritime industry to meet an unknown threat that may strike at any time. In responding to such threats no one agency or organization has the capability to mount a response. Assessment of risk is ongoing and a massive amount of information is analysed from many sources. The planning to date has not been tested in this region. There is a comprehensive plan and a key command and control structure in place. DOTARS as the government department responsible has been on a huge learning curve about the shipping and port industry. Through actively involving all facets of the industry DOTARS has opened an effective communication channel with industry and gained in a short period of time broad knowledge of the industry and access to an effective network of expertise. This must be a goal for planning and assessing preparedness to deal with chemical incidents. Whilst we can honestly say we are never going to get the level of importance that security has been given in recent times, realistically assessing our capability and then improving our level of preparedness on an ongoing basis is essential.

## **“LET US NOT BE COMPLACENT “**

When diving into the shallow pool of knowledge in industry and in particular the domestic Australian and New Zealand seagoing industry is suffering a decline on the supply side of experience. Expertise in specialised ships has reduced dramatically. Local operators once ran sophisticated gas and other tankers, now in general the domestic local fleets have declined. This is part of a global decline in marine experience and I wonder who will be standing up here in 5, 10 or 20 years. When I look at the audience I see friends and colleagues who have all risen from the lowly level of cadet or trainee to important industry positions I wonder where the industry will be sourcing that knowledge pool in the future. You can be sure that chemical tankers will be trading on our coasts and through our ports. The risk will not disappear. Our planning must include issues such as salvage and emergency towage capability.

### **SUMMARY**

We cannot afford to be complacent. We need to continue to have forums such as SPILLCON to develop our partnerships. We then need to test our levels of preparedness. We need to learn from incidents where ever they occur and then apply that knowledge to improving our level of preparedness. In reviewing the incidents I have mentioned we need to look at greater industry issues such as, salvage capability offshore and in port areas, ports of refuge and planning for ship to ship transfers to mention a few. We need to manage the precious pool of knowledge that we still have and work out how we are going to stop the knowledge drought that is developing in the future.

Thank you for listening.

## PREPAREDNESS AS DEFINED IN A THESAURUS CAN MEAN

Readiness, fitness, suitability, qualification, competence

In assessing our preparedness we need to ask ourselves involved in the industry questions to assess what status they are at in each category to meet a state of preparedness.

**READINESS**, has training taken place in core disciplines to ensure that all participants are in fact ready to deal with an incident?

**FITNESS**, are the participants up to date and have the right knowledge to react quickly to changing and evolving incidents?

**SUITABILITY**, are the correct participants available to meet the specific needs of an incident?

**QUALIFICATIONS**, are the appropriate participants suitably qualified to advise when responding to an incident?

**COMPETENCE**, are participants suitably current with developments in the chemical industry to be able to provide competent advice and instructions?

What can be observed is that to be truly prepared no single person or single organization alone can be truly prepared to meet chemical incidents in what ever form. When planning a response one must be able to gather together quickly a team that can assess any incident. Planning must ensure the team can be further supported by knowledgeable people as an incident escalates. Flexibility within the team is critical to the success of any response. At the same time a disciplined command and control structure is essential, these structures are already in place in existing oil spill contingency plans and adapt easily to chemical incident responses.