



# *The Porthole*

**Volume 14 No. 9  
September 2014**

The newsletter of the South Australian Branch of the Company of Master Mariners of Australia.

PO Box 1, PORT ADELAIDE, SA 5015



## **From the Editor**

Due a technical 'glitch' at my end there are no Branch Master's comments this month, so comments from me about two recent short-haul flights made while on holiday in Europe.

A Southampton-Dublin return flight was interesting as the return to Southampton occurred during a north-easterly wind. The flight flew over Southampton Water; seated on the port side I enjoyed views over the Solent, Spithead and the Fawley tanker berths and, after the aircraft turned to starboard for the final approach, we recrossed the Water allowing views of the car carriers and cruise ships in the Eastern Docks and container ships in the distance.

The Irish Sea had appeared quiet with only a Dublin bound ferry being sighted while on final approach.

A return flight between Rome and Tel Aviv-Yafo, travelling POSH, afforded views of Vesuvius brooding over the Bay of Naples. Later, after crossing the 'toe' of Italy, we overflowed a small bulk carrier; the force 4 W'ly wind was from directly astern, the plume of the diesel exhaust extending over the bow. Returning, we were further north, affording good views of Piraeus and Salamis; with their fleets of laid-up ships, and later the Gulf of Corinth, before flying up the east coast of Italy with views over the Adriatic Sea and ferries heading to Brindisi until, when over Abruzzi, we turned to make our approach to Rome.

## **Guest Speakers:**

September: Kevin Jones, S A Maritime Museum

October: Dr. Jack Wearne, Topic: "Drugs and Alcohol"

November: TBA

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**The next Branch Meeting will be held at  
the Largs Pier Hotel, 198 The Esplanade, Largs Bay,  
on Wednesday, 24th September 2014 at 1145 for 1200.**

**Please confirm your attendance at the lunch or register your apology  
before 1200 on Monday, 22nd August 2014 with either  
Ian Dickson (8396 1030) or Robert Westley (8536 4863)**



The Company of Master Mariners of Australia Ltd. is a Company established to promote and further the efficiency of the Sea Service generally, and uphold the Status, Dignity, and Prestige of Master Mariners in particular.

The Company of Master Mariners of Australia Ltd., S.A. Branch.

Branch Meeting at the Largs Pier Hotel, on 27 August 2014, at 1200.

Minutes

Opening: Meeting opened at 1205. The Branch Master welcomed members.

Members present: Capts Westley (Branch Master), Buchanan, Carr, Carter, Dickson, Ferrao, Hammond, Hehir, Holmes, Kemp, Lydell, Parsons & Pronk.

Apologies: Sir Eric Neal, Capts Bourne-Jones, Carrington, Fraser, Marshall, Pearson, Phillips & Rajagapolan.

Presentation: Membership certificate for Alan Lydell was presented by the Branch Master:

Minutes of the last business meeting: Minutes of the last meeting held on 30<sup>th</sup> July 2014 were circulated in the Porthole. Capt Holmes proposed that the minutes be accepted as a true and correct record. Seconded by Capt Hammond and carried

Business arising from the minutes:

a) Speakers:

August Dr Jack Wearne, RAH emergency doctor was unable to attend.

September Kevin Jones, SA Maritime Museum: Topic: To be advised.

???? Kate Linley: Topic: Under Keel Clearances. (Bob Westley/Howard Pronk?)

Visits: Suggestions welcome.

b) Other business arising from the minutes: None.

Treasurer's report: (Report tabled)

Balance at 23/07/14	2,530.09	Bendigo Bank deposit balance at 23/07/14	2,696.26
Income Subs & Interest	0.00	Interest added quarterly	<u>0.00</u>
Expenditure Postage of "Master Mariner"	<u>-1,992.00</u>	Bendigo Bank deposit balance at 24/08/14	<u>2,696.26</u>
Balance at 24/08/14	<u>538.09</u>	Bendigo Bank Term Deposit at 23/07/14	6,809.91
		Re-invested for 12 months from 02/02/14 @ 3.55%	

Membership:

Applications:

Applicant	Status sought	Branch	Remarks
Adam David McPHAIL	Associate	Western Australia	ex Navy – Marine Pilot at Cape Cuvier
Graham Douglas DAVEY	Ordinary	Western Australia	Marine pilot – Port Hedland
Induka Asela RANASINGHE	Ordinary	Western Australia	Marine Surveyor in Pilbara Ports
Michael David EDWARDS	Ordinary	Western Australia	Marine Pilot – Port Hedland Pilots
Roy Henry STANBROOK	Ordinary	Melbourne	Harbour Master – Melbourne
Robert HILDEBRAND	Ordinary	Western Australia	Off-take Coordinator with Woodside

The Secretary was requested to ascertain further details concerning the applications of Michael Edwards.

Ratifications: Nil

Branch Members:

Category	Number		
	Financial	Unfinancial	Total
Members	8	0	8
Seagoing members (incl. tug crews & pilots)	3	0	3
Retired members	15	0	15
Associate member	<u>3</u>	<u>0</u>	<u>3</u>
Total paying members	29	0	29
Honorary members	<u>4</u>	<u>0</u>	<u>4</u>
Total Levied Members	<u>33</u>	<u>0</u>	33
Life Members			<u>2</u>
Total Branch Membership			<u>35</u>

8. Correspondence 19/07/14 to 15/08/14: Inwards correspondence was received and outwards correspondence was approved at the Branch Court meeting on 20/08/14. A summary was tabled for members' information.
9. Federal Matters:
  - a) Federal Court: Nothing to report.
  - b) Constitutional changes: Nothing to report.
  - c) 75<sup>th</sup> anniversary book: Still being reviewed at Federal level.
  - d) Other Federal business: Nil.
- .10. Motions on Notice: Nil.
11. General Business:
  - a) Capt Lydell asked if there were any further developments concerning Vice-Regal patronage. The Branch Master said that further discussions were taking place, and, although he would not agree to become Patron, it is possible that Sir Peter Cosgrove could accept the title of Master of the Company.  
 Capt Parsons pointed out that the present State Governor (Rear-Admiral Kevin Scarce) was about to come to the end of his term of office, and asked about the patronage of this Branch. The Branch Master responded that the Branch had received advice from the Governor that his tenure was ending, and advised that a letter was being written to Rear Admiral Scarce to thank him for his role as patron of the S.A. Branch of the Company. An invitation will be sent to the new Governor, after he assumes office early in September.
12. **The next Branch meeting will be held at 1145 for 1200 on Wednesday, 24 September 2014, at the Largs Pier Hotel, Largs Bay. Speaker: Kevin Jones, South Australian Maritime Museum Curator. Topic: To be advised.**
13. Closure: The business meeting then closed at 1240 hrs, and lunch was taken.
14. After lunch, in the absence of the intended guest speaker, Capt. Buchanan gave an illustrated account of his recent tour of Turkey, which he had evidently enjoyed very much



*Preceding page:*

The Jubilee Sailing Trust barque TENACIOUS outward bound on Southampton Water on 17 August 2014.  
The 'Greenland' starboard hand buoy is visible ahead of TENACIOUS.

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## UOC Logistics

Rebecca Otte and Frank Boulton

30 July 2014

Uranium (U) is a naturally occurring, mildly radioactive element that is widely distributed in the Earth's crust, rivers and oceans.

Australian Uranium is exported as either of two product types:

Uranium Oxide Concentrate (UOC) in form of Uranium Oxide U3O8

Maximum activity per 20' shipping container: 440 Giga Bequerels

Uranium Ore Concentrate (UOC) in the form of Uranium Oxide UO4

Maximum activity per 20' shipping container: 330 Giga Bequerels

Both products are classified under the same UN DG class, number and description, i.e.:  
Class 7, UN2912, Radioactive Material Low Specific Activity (LSA-1 non fissile or fissile excepted)

Category III Yellow.

U3O8, shipped from BHP Billiton (BHBP), Olympic Dam, South Australia and from Energy Resources Australia, Northern Territory, is calcined material and shipped as a powder, dark green to black in colour.



UO4, shipped from Heathgate Resources (HGR), Beverley facility, South Australia is shipped as a dried powder, light yellow in colour.

Different production processes are used due to the way the UOC is found to occur at the different sites. These differences also result in a difference in the density of the product being shipped and thus a variation in the number of drums (48 BHPB / 63 HGR) of product shipped in a container for approximately the same nett container weight.

Uranium is 65% heavier than Lead, slightly toxic, non-flammable, non-combustible, non-explosive, non-corrosive and only mildly radioactive.

UOC is currently (2014) exported for processing (conversion) to the USA, Canada, Europe and China.

Radiation Protection and UOC

### Managing Radiation Safety

Occupational radiation exposure is a factor of the time spent working around the material and the intensity of radiation emitted by the material.

The total minimal time spent handling or transporting UOC ensures very low exposure.

UOC packed within 20' shipping containers has a very low level of radioactivity.

### To minimise time spent

Do not store shipping containers of radioactive materials near regular places of work, offices, repair workshops, highly trafficked zones, meal break areas, etc.

Do not store shipping containers of radioactive materials near to refrigerated cargo, dry foods etc.

## Radiation Protection and UOC

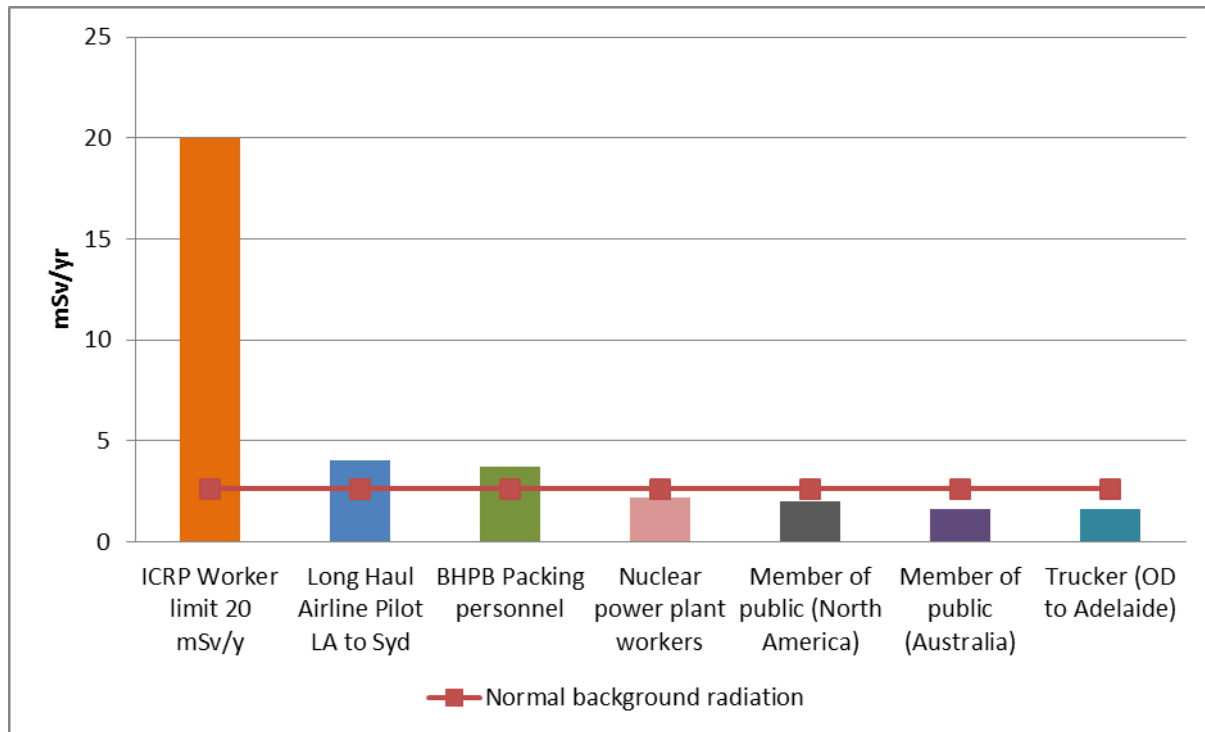
### Comparative dose rate exposures

Natural background radiation is around 2 mSv/yr.

The worker dose limit as per the International Commission for Radiological Protection ICRP limit is 20 mSv/yr averaged over 5 years with no more than 50m/Sv in one full year.

The WHO reported that most people in Fukushima prefecture would have received a radiation dose of between 1 and 10 mSv during the first year after the Tsunami struck the Fukushima Daiichi nuclear power plant , disabling the power supply.

[http://www.world-nuclear-news.org/RS\\_WHO\\_on\\_Fukushima\\_doses\\_2405121.html](http://www.world-nuclear-news.org/RS_WHO_on_Fukushima_doses_2405121.html)



The graph above includes background radiation

### The Situation at Fukushima

A major earthquake on 11 March 2011 caused a 15-metre tsunami to strike the Fukushima Daiichi nuclear power plant on Japan's Tohoku coast, disabling the power supply and heat sinks, thereby triggering a nuclear accident. The reactors involved were boiling water units of a 1960s design owned and operated by Tokyo Electric Power Company and supplied by GE, Toshiba and Hitachi. Reactors 1-4 came into commercial operation 1971-78. Without cooling water, the cores of units 1, 2 and 3 overheated and largely melted in the first three days. Hydrogen generated by this high-temperature process caused explosions in the upper service floors of reactor buildings at units 1 and 3. Unit 4 had not been operating, but was affected by a hydrogen explosion due to gas back-flow from unit 3. All four reactors are written off. Two other reactors at the plant were not involved in the accident. The major accident was rated at Level 7 on the International Nuclear Event Scale due to high radioactive releases to air in the first few days. The bulk of releases occurred with the explosions, while a leak of contaminated water to sea continued for two months. Further releases of radioactivity to the air were brought to insignificant levels before the end of 2011, although much radioactivity remains dispersed on the ground in the surrounding area.

### Effects on people

Significant amounts of radioactivity were released, but prompt evacuation from the immediate area made sure that no member of the public received enough exposure to cause harm. Some 160,000 people were evacuated from their homes and only in 2012 were some allowed limited return. Certain areas are still off limits. Radiation was never expected to have any measureable effect on the health of the population and this was confirmed in 2013 by an estimation from the UN Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) that no person in Fukushima prefecture would be exposed, through the environment or their food, to more than 10 mSv in their entire lifetime. This is one tenth of the level at which health effects are known to become more likely, and therefore no measureable increase in cancer rates is expected. The government continues to monitor the health of all Fukushima residents. Stress, worry and the social problems of relocation have been repeatedly identified as the only likely causes of ill health.

## Incident Response for UOC

**There is a structured approach to the management of any incident response associated with UOC**

Port and terminal initial ER

Local fire, police etc

ERAP and backup assistance and technical support from consignor/consignee such as

Transport Logistics in the USA and Europe

Cameco Corporation in Canada

Consignees should be contacted in a timely manner should an incident occur.

The regulatory authority and the consignor must be informed of any incident involving a spillage of material.

It is important that any incident, no matter how small, is documented so that the authorities can be advised and so that a learning can be shared amongst the industry.

### If there was a UOC spill

Activate normal hazardous emergency management procedure, remembering the need to manage radiation safety requirements. Cordon off area and provide first aid to any injured persons. Standard PPE plus a dust mask, coveralls and PVC rubber or cotton gloves. Other than the inhalation hazard, spilled UOC does not pose any immediate danger.

As UOC has slight chemical toxicity, is weakly radioactive, inhalation and ingestion should be avoided. UOC is toxic if inhaled or swallowed.

UOC, being principally an alpha emitter, is unable to penetrate through the skin on our bodies.

UOC is a very heavy metal, insoluble, non-combustible, non-explosive, non-corrosive and only mildly radioactive.



In the case of a spillage of radioactive material, person 'A' should wear a dust mask, and protective clothing, endeavouring to limit the amount of time spent around the spillage. Persons 'B' being in this situation upwind should limit the time in that area and if possible move to a position down wind of the spillage whereby he can provide assistance to Person 'A' as required.

Under no circumstances should persons at the scene endeavour to retrieve or collect any of the material.

These activities should be left to the experts such as the local fire service or other technical support as may be deemed necessary.

## Incident Response for UOC

### In the course of normal business, incidents, bumps and shunts can occur

Check for indications of spillage (visual or raised levels of radioactivity) If there are no signs of any spillage, notify and consult with the consignors on carrier representative as to agreed means of repairing any minor damage in order to reinstate normal conditions.

Below are examples of incidents that can occur during transport and handling operations. RSB were notified and the containers inspected by the regulators before being transported to their final destination.



Below are examples of incidents that can occur during transport and handling operations.

### Handling & Storage of UOC containers

As per all dangerous goods, UOC containers must be handled with due care. An incident like a puncture hole through a container can create the potential for UOC to spill. Whilst drums and shipping containers are made of steel which can be penetrated there are layers or levels of protection, a heavy duty plastic spill sheet, the heavy duty steel drum package plus the outer packaging protection provided by the steel shipping container.



Like the Titanic, if the container hits something it will dent, bend, puncture and in extreme cases open. Container handling is therefore a paramount safety issue for shipping lines, ports, terminals and their employees . All containers, irrespective of their contents, should be treated with absolute and total due care.

### Drums

Drums are sourced from two national suppliers, based in Melbourne and Perth, and include two types of 200 litre steel drums, both types IP1 tested and approved. BHPB and ERA use centre-fill drums for their calcined U3O8, whereas HGR use open-top drums for their dried UO4.

### Shipping containers

All current consignors utilise shipper supplied units. Common use of same single international container supplier. Highest possible quality standards for shipping containers, included less than 3 years old and 30 tonne rated.

### Best practice inspection standards

Initial inspection by external provider at container yard - specific standards set by shipper consignors.  
Pre packing inspection by shipper/consignor following receipt at mine site -addresses the potential for in-transit and handling damage during transport, and addresses packer obligations under AMSA marine orders and IMDG requirements.  
Independent post packing inspection by shipper consignors - focuses on external and internal quality  
Overall cleanliness and contamination check inspections prior to departure from mine site - provides the final once over check.  
Visual checks at all stages of transfer throughout the supply chain.

### Packing UOC

#### Process

An automated process fills IP-1 rated 205 litre drums with UOC. Drums are sealed, washed and weighed before being placed on pallets before being packed into standard 20' shipping containers.

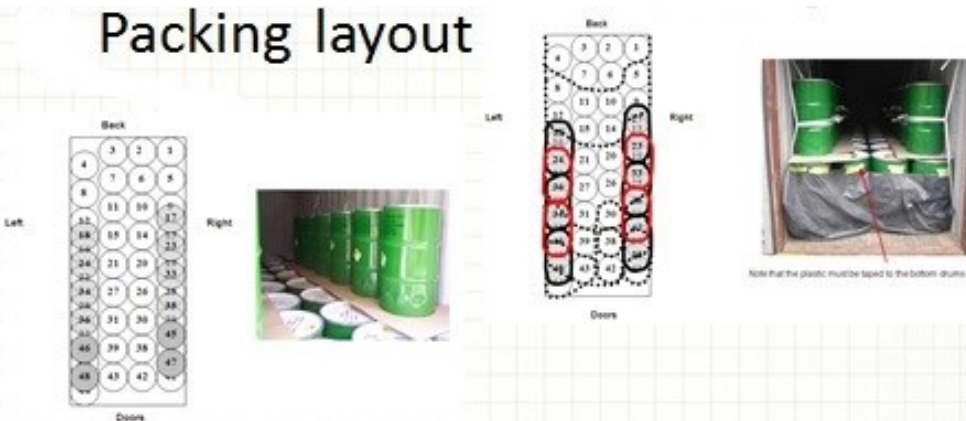


Containers are prepared with plastic lining on the base and vertical straps on each side.

48 drums (BHPB) or 63 drums (HGR) are packed into standard 20' shipping containers using a standard method and format approved by AMSA. Drums are strapped into containers using a Kevlar webbing based strapping.



## Packing layout



Cardboard wafering is placed in-between the top and bottom layer to provide a non slip friction pad between the two layers of drums.

Over 5000 containers have been exported from Australia using this method.

Environmentally friendly packing solution - no need to dispose of large amounts of timber .

Improved worker safety, no power saws, nails, screws, splinters.

Common approach to web based lashing and securing systems

All systems are AMSA approved with voluntary annual audits of shipper consignor



### Documentation

A standard set of documentation is provided to the shipping line for each UOC delivery

Predictable, fully declared unitized cargo.

Default activity and transport index used.

Documents Include:

Safety Data Sheet

Multimodal Dangerous Goods Form

Summary of Delivery container packing list and radiation dose rate

Certificate of Origin

CT-PAT container indemnity and cleanliness certification

### Safety Data Sheets

The use of shared transport systems by all parties requires a standardised SDS

All parties have adopted the use of the global harmonised systems approach to layout, overall content, look and feel. Some differences in the wording of specific technical content requires review and subsequent agreement by all parties.

**Road transport**

UOC is transported from mine to Port via road trains and the rail is also utilised from Darwin to Adelaide.  
 Whilst the roads are bitumen from Olympic Dam and Ranger, 4 Mile exports are transported along 300km of dirt roads before reaching the hwy.  
 Notices are sent to appropriate authorities on day of shipment.  
 All daily movements are monitored with notifications to the mine sites on completion of delivery.



**Transport plan**

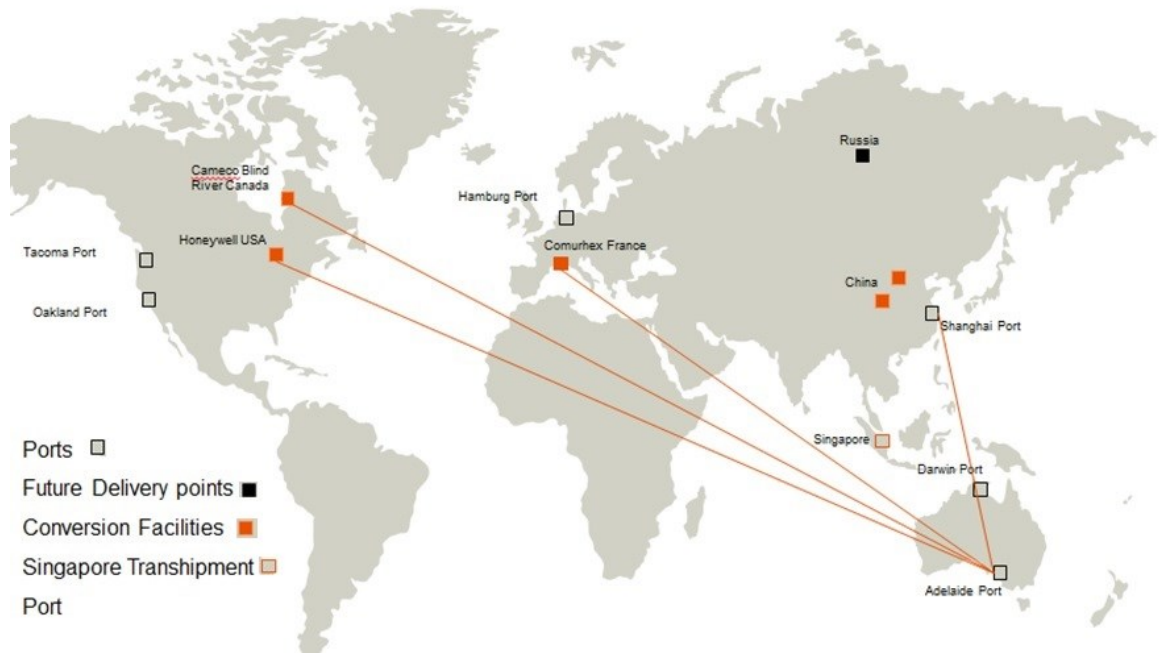
All transport of UOC within Australia must have a Transport Management Plan approved by the Federal and relevant State and/or Territory governments effected by the transport.

**Ocean transport**

Preference for using liner cargo container vessels.  
 All stows under deck, common approach by load port vessel planners applicable for all carriers.  
 Underdeck stowage applies to transshipments.  
 Excellent relationships with carriers, load, transshipment and discharge ports and terminals.

**Current approved routes**

- Adelaide to Oakland or Tacoma.
- Adelaide to Philadelphia
- Adelaide to Europe (with transshipment in Tacoma).
- Adelaide to Shanghai (with transshipment in Singapore).
- Darwin to Shanghai – charter vessels



## Inland Transport

### Inland transport from North American port of discharge to Converter

A specialist transport service provider is contracted and provides the following services: Customs clearance; Collection of containers from discharge port; Road transport from discharge port to Converter; Arrange delivery of containers into Converter; Arranging for empty containers to be delivered back to container depot after unloading of drums by Converter.

The specialist transport provider has excellent relationships with carriers, discharge and transshipment ports, terminals and the Converters.

### Inland transport from European port of discharge to Converter

As above, however containers are railed from the port in Europe to the Converter.

The Australian regulatory framework

Requirements associated with the production, storage and transport of radioactive materials is highly regulated.

Australian Safeguards Non-proliferation Office (ASNO)

ensures the strict adherence to safeguards and related protocols

Department of Resources Energy and Transport (DRET)

management and monitoring of strict export controls.

Australian Maritime Safety Authority (AMSA)

packaging, IMO, SOLAS, stowage, segregation etc.

Australian Customs and Border Protection

UOC is a restricted export under strategic goods control.

Challenges – Transport of UOC

#### Regulation

Overarching regulations are set and imposed by the International Atomic Energy Authority (IAEA). These regulations are adopted by the Australian Safeguards and Non-proliferation Office (ASNO) in Australia. For export and transport, additional regulation from the Australian Customs (prohibited exports) regulations, the IMDG Code administered by Maritime Safety Authority, the Northern Territory Government and the South Australian Governments.

Australian uranium shipments meet both Australian and international standards using highest packaging standards to minimise potential for any health, safety, environmental or community related issues.

#### Shipping

Australia's internal ASNO safeguard requirements can create restrictions and limitations on availability of shipping routes.

Some carriers, ports and shipping terminals hold reservations about the acceptance of UOC believing the additional regulatory burdens and potential for in transit port issues too great for the return.

#### Safety and security

The safety and security of UOC is essential at all times during production, storage and transit of UOC. An incident anywhere in the world will often affect the whole industry.

#### Improved education

The low level radioactivity associated with UOC creates a sense of unnecessary uncertainty as it lacks odour, it is not visible, you can't see it, there is no sense of feel, temperature etc.

It is all about atoms, neutrons, physics and chemistry and essentially UOC is a very heavy metal.

The low levels associated with UOC will not hurt you, however the impact of a drum of UOC at around 400kg or 880lbs will if it is dropped on you.

Need for acceptance as a mainstream dangerous goods material. Additional screening is not necessary for such a fully declared cargo.

All associated export processes are subject to constant, continual and ongoing change, mainly at an international level.

The ongoing challenge is to ensure transit and or transshipment permits, notifications etc remain manageable, through the development of mechanisms whereby these requirements are met as part and parcel of the over-all shipping line vessel and voyage notification processes.

## Why do UOC shipments take the long way round?

During the July presentation the question was asked “Why is UOC consigned to Europe routed across North America?” A decade ago the situation was reversed and UOC for North America was routed via Hamburg. Why?

The following examples are based on events and restrictions on the carriage of Class 7 in general and UOC in particular that were applicable during the period 1998 to 2005. Some or all of these restrictions may have changed during the intervening years.

**Flag:** Not all flag jurisdictions, such as the Marshall Islands flag, were acceptable to Australian authorities therefore carriage of UOC on ships of that flag was not permitted.

**Owners:** Not all owners will permit charterers to load UOC on their ships. Generally the company that provided the Bill of Lading, the carrier, insisted the cargo move in their containers, in their ships. The exception was on-carriage between Hamburg and Philadelphia/Europe where a second carrier was used who issued their own B/Ls, but the UOC shipments remained in the first carriers containers.

**Transshipment:** For transshipment to occur, there had to be a bi-national treaty in place between Australia and the country in which the transshipment was to occur. Other than north-east Europe and North America, Singapore and New Zealand were the only countries where transshipment was permitted.

Malaysia was agreeable to sign a treaty, but the state governments in which Port Kelang and Tanjung Pelepas were situated were not, so this was never pursued, especially as transshipment was permitted at Singapore.

In New Zealand, Auckland was the only port considered for transshipment but Auckland Port/ City Council placed so many restrictions, such as direct ship to ship transfer; no UOC to be left in storage at the port; each road movement to be the subject of a public audit, as to render the idea impractical.

**Transit Ports:** Generally transit was not a problem provided the UOC shipment was in permanent stow so that no handling for restows, etc., was required, but some ports did have restrictions.

**Colombo:** During that period there was civil war in progress in Sri Lanka, thus transit was not permitted by Australian authorities.

**Jeddah:** Transit of Class 7 forbidden by Saudi authorities

**Damietta:** Transit of Class 7 permitted subject to an inspection at anchorage prior to berthing. This could result in a 24 hour delay which was unacceptable. Vessels calling Damietta northbound would have made a transit of the Suez Canal a few hours previously, and been the subject of a similar inspection by the Egyptian inspectorate. This inspection was performed during the canal transit and did not delay the carrying vessel.

**Italian ports:** Officially transit of Class 7 was permitted subject to an inspection. However a vessel carrying a trial shipment of Class 7, not UOC, after waiting an anchor for 24 hours and still no sign of the inspectors cancelled the call and another vessel had to be diverted to pick up the export cargo. Class 7 was never again allowed on ships calling at Italian ports.

**Thailand:** Were way ports on the service from Singapore to the North American west coast. Neither country permitted vessels carrying UOC to transit their ports.

**Diversions:** Vessels carrying UOC could not normally divert to other ports.

In one case, a major shipper wanted to ship a large parcel of containers to a Caribbean country. As it would have taken about 8 weeks to obtain a transit permit for the UOC shipments scheduled for that sailing, the decision was made not to load the UOC. About 12 hours after the vessel departed Adelaide, the extra parcel was cancelled as was the Caribbean diversion!

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On Tuesday, August 19, 2003 the U.S. flag container ship "SEALAND EXPRESS" was anchored in Table Bay awaiting a berth. The ship was owned by United States Ship Management and was on charter to the Danish owned Maersk Line. She had previously loaded at Durban, where about 50 tonnes of Uranium Ore Concentrate (UOC) in 3 x 20' containers was among the containers loaded at that port, and at Port Elizabeth. The cargo was destined for the East Coast of the U.S.A. It was reported that the Second Mate, standing the 12-04 watch had become concerned at the Gale force SW'ly wind but had not taken any precautions. Similarly it was reported that the Chief Mate, on the 04-08 watch, had not taken any precautions, even when advised by Cape Town harbour control that the "SEALAND EXPRESS" was dragging its anchor towards a lee shore. No recording of this warning exists as, it was reported at the inquiry, that the Port Control voice recorder was not functioning at the time of the incident. It was later alleged that the ship had dragged its anchor for two hours, during which time no extra precautions were taken. At 0630 local time the SEALAND EXPRESS grounded at Sunset Beach.



The initial response by the media and politicians concerned the shipment of Uranium but after the first couple of days concern was transferred to the 3,700 tonnes of fuel oil, most of it in the double bottoms, and the other 30 containers of hazardous cargo that were on board. The hazardous cargo included fireworks, and 18 tonnes of an oxide of antimony, a toxic chemical. It was later reported that the toxic chemicals, if spilled into the sea, would kill most of the underwater flora in the area thus threatening the marine fauna. The other problem that emerged was that if the fuel tanks ruptured the resulting spill would threaten the Koeberg nuclear power station by clogging the intake filtration of the turbine intakes. Should that have occurred the power station would have had to be shut down or the capacity be reduced.

Plans were made to remove the fuel oil by a pipeline to shore; while that was being set up fuel oil was off-loaded into tugs. A dredger was contracted to remove shingle from the shoal on which the vessel had grounded in preparation for re-floating.



The weather was considered too dangerous for a floating crane to be placed alongside; in its place a Russian built Mi8 helicopter with a capacity of 4.5 tonnes was chartered. Containers considered the biggest threat to the environment were unpacked on board the ship. However the UOC remained on board throughout the salvage and indeed when the ship returned to Durban for dry-docking and repairs.

A dredger was used to clear a channel for the ship to be towed out through the shoal.

After several attempts and with no loss of fuel oil or containers 'SEALAND EXPRESS was refloated on 13 September. She berthed at Cape Town for temporary repairs and discharge of containers in preparation for her tow to Durban for dry-docking.

During repairs an iron cannonball and some timbers were found in the damaged double bottom tanks. Captain Mike Carrington tells me they came from the Dutch sailing vessel "Haarlem".

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