Proceedings of the 17th International Symposium on the Packaging and Transportation of Radioactive Materials
PATRAM 2013
August 18-23, 2013, San Francisco, CA, USA

OPENING NEW ROADS FOR URANIUM TRANSPORTS

Authors:

F. Bimet
TN International

C. Lauron
CCLog

ABSTRACT

Transport Risk Management has been developed by AREVA to establish the strictest control over its radioactive material shipments as well as to ensure that all roads are kept open for the flows of materials to and from AREVA facilities world-wide.

As an example, this paper will show how TN International's (TNI) Transport Risk Management® has helped secure the uranium concentrate flows from Kazakhstan to China following a sudden shut-down of the Kazakhstan/China border for political reasons resulting in a denial of access. Steps were quickly taken to set-up an alternative route by sea and to strengthen the supply chain using an innovative approach with the major ocean liner, CMA CGM. This was possible due to the launch of a global acceptance program, including the necessary definition of interfaces, a specific data and communications plan, and the support and expertise proposed to stakeholders at ports and in national waters along this maritime route. Stakeholders include customs officers, security officers, port authorities, national and maritime authorities, stevedores and port handling utilities, as well as ocean liners, including their ship captains and crews. The alternative route from Kazakhstan to China is now open to the benefit of the industry at large.

INTRODUCTION

TNI manages up to 6,000 shipments pear year throughout the nuclear fuel cycle (from mining to ultimate waste management). The characteristics and sensitivity of these shipments are quite different depending on the material, the casks, the national or international scope and the modes (road, rail, air and/or sea).

Within this context and with the objective of managing these operations at the highest level of safety, security and performance, TNI has developed and implemented its Transport Risk Management® methodology.

RISK IDENTIFICATION

For both AREVA shipments and external customer shipments, risk is evaluated for each transportation flow taking into account the level of danger calculated by analysing the gravity of a possible accident and the probability of it occurring.

To manage this risk at the appropriate level, TNI teams evaluate each operator's capacity (defined by criteria such as organization, processes, competencies and means) to ensure Risk Management on the transportation steps on which the operator is involved.

The TNI method covers safety, security, industrial, media and commercial risks.

For each flow, the evaluation demonstrates the operator's ability to manage the risks and recommends improvement measures to the logistics scheme. For more detailed information concerning TNI's Transport Risk Management®, please see the paper by Véronique BRANDON, "Success Stories through Transport Risk Management®," published in the 2013 PATRAM.

Very often, in the risk analysis profile the maritime phase of the multi-modal flow is identified as the weak link. This is due to several factors such as piracy risks, technical risks of vessels or unloading/loading operation risks in ports. All efforts to manage such risks must be deployed to avoid any Denial and Delay issue.

DENIAL AND DELAY

Denial and delay in the transport of radioactive material is not uncommon, especially in maritime transportation.

All responsible nuclear parties involved in the logistics chain work diligently to keep roads open to ensure safe deliveries of nuclear material on the sea worldwide. In parallel, the main stake is now to open new and alternative routes taking into consideration evolving political, authority and industrial nuclear needs.

Solutions are difficult to work out. Denials of both entry and of trans-shipments in ports and refusals by carriers have their origin in misperceptions about the material to be transported, the measures that are taken for safety and security requirements. Moreover, there is no obvious leverage on carriers and port actors to oblige them accept our material (class 7 cargo): the quantities of nuclear cargo to be shipped are small and potentially risky, and cannot be compared to small volume/small risk or large volume/larger risk ratios of other sectors.

In response to these issues, the IAEA has developed a range of initiatives: training, diffusion of information and the creation of a specific Steering Committee on Denial of shipment. The industrial sector has brought together nuclear utilities, producers, transport companies, package producers, all involved in the World Nuclear Transport Institute (WNTI), to support international efforts through exchanges with outside actors (port and maritime authorities, handlers, liner companies…). An "Industry Knowledge Base" has been developed by WNTI and information /education is provided by technical experts.

In parallel to these global actions, TNI works on day-to-day actions to mitigate obstacles of Risk and Denial and Delay. The main initiatives are to set up trust links with maritime companies to secure the routes and a Global Acceptance Program for involved actors such as local/port authorities, stevedores, port handling utilities and/or ocean liners.

As an example, this paper will show how TNI's Transport Risk Management® initiative and other actions set up to solve Denial and Delay issues have been efficient to secure the uranium concentrate flows from Kazakhstan to China.

ALTERNATIVE ROUTE FROM KAZAKHSTAN TO CHINA

Context: All the transport of uranium concentrate from Kazakhstan to China had been executed by rail (Alashankou railway station).

For 5 months, from March-August 2012, the border between Kazakhstan and China had been closed. To ensure material deliveries, it was important to find an alternative road.

The only possibility from Russia was to use the port of Saint Petersburg (qualified for Class 7 cargo) for sea transport to China.

From Europe to China, only 2 maritime liners accepted containers with uranium: Cosco and CMA CGM.

- Cosco's last port of call in Europe is Rotterdam, necessitating 14 weeks to obtain the license for a trans-shipment from the local authorities, an impossibility knowing that the containers had to arrive before the end of 2012.
- CMA CGM proposed one vessel per week from Le Havre to Shanghai. Thus it was possible to notify the French Competent Authority just 15 days before the departure.

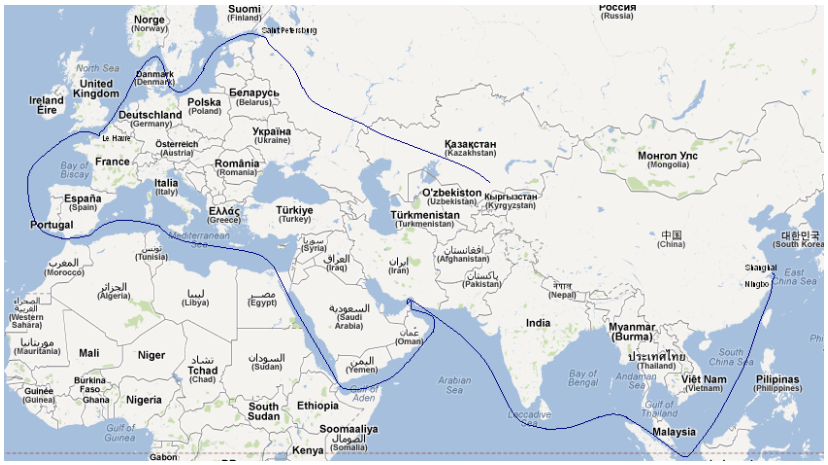

Figure 1: Flow used to transport uranium concentrates from Kazakhstan to China

The solution proposed by TNI and CMA CGM was challenging with significant obstacles:

- Short deadline
- New routes and logistics scheme with trans-shipment operations
- Interface with authorities from countries with whom we had never worked for acquisition of the transit permissions (Malta, Suez Canal, Khor Fakkan, Jebel Ali, Ningbo and Shanghai)
- Loading of containers on board => hold or deck (different requirements depending on the transit port…)
- High security level required for this logistics scheme => sailing through Suez Canal and Gulf of Aden
- Coordination between different actors (time difference; language barrier, etc.)

The preparation: For this multimodal shipment (rail, road, two maritime phases, one trans-shipment and 4 transit ports plus the Suez Canal), the teams from TNI and CMA CGM were mobilized to interface with the actors: consignor, other shipping companies, handling companies, customs brokers, radioactivity inspection company, safety and local authorities, etc.

First maritime phase Saint-Petersburg → Le Havre

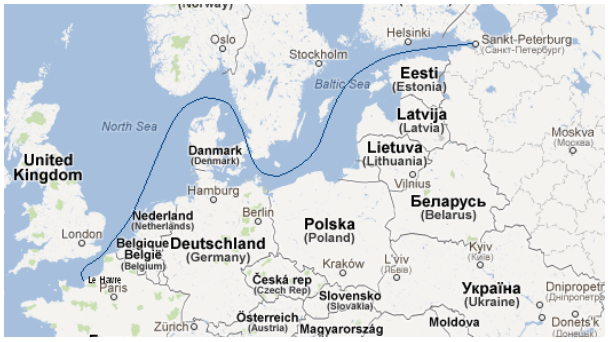

Figure 2: First maritime phase

The first maritime phase was executed by the Russian maritime charter company, NSC. This phase was relatively straightforward to implement for the following reasons:

- Previously established TNI experience in transport to/from St. Petersburg and Le Havre => good partnership with Russian maritime charter company
- Flexibility in booking and management of the arrival of the vessel in Le Havre to coordinate with the Estimated Time of Arrival (ETA) of the liner vessel before trans-shipment
- Only 7 days of maritime transport

Trans-shipment in Le Havre port

This step of the logistics scheme included several tasks easily handled due to TNI experience:

- Notification to the French Competent Authority 15 days before the departure
- Preliminary and coordination meetings with different actors from Le Havre port (TNI, two maritime companies, handling company, inspection company, port authority, guarding service, dockers company, customs broker)
- Requirements and constraints to manage: Non storage of 7 Class containers at the port, the arrival of both vessels at the same time so that trans-shipment operations could be done during high tide
- Radioactivity control on board the first vessel
- Handling operations
- Unloading
- Temporary storage in reserved guarded area on the dock
- Loading on the second vessel
- Radioactivity control of the storage area and on board the second vessel

Second maritime phase Le Havre → Shanghai

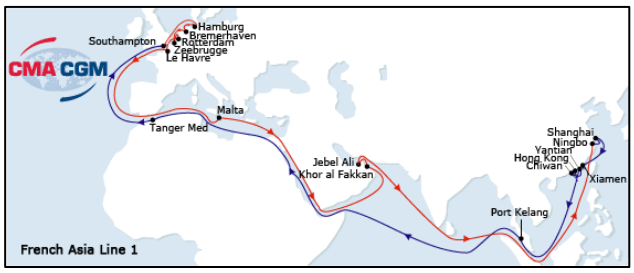

Figure 3: Second maritime phase

The second maritime phase posed significant challenges with unexpected overwhelming positive results:

- Dynamic partnership between TNI and CMA CGM
- Improved safety and security through the concerted effort of CMA/CGM and TNI control rooms for daily checking of the vessel position
- A new logistics scheme that is now integrated into the TNI offerings for shipment of Class 7 material
- Important new interfaces with international authorities in transit and consignee ports
    - Valetta (Malta), Suez Canal (Egypt), Khor Fakkan & Jebel Ali (United Arab Emirates), Ningbo & Shanghai (China)
    - TNI and CMA/CGM representatives met with local safety, security and port authorities in UAE and in China to obtain Authorizations

PARTNERSHIP CMA CGM / TNI: THE KEY TO SUCCESS

The steps taken by TNI to secure the maritime phase by having a reliable partnership with the Shipping Company CMA-CGM are described below. The results are remarkable: worldwide, regular and sustainable maritime deliveries of Class 7 material.

CMA CGM is the largest global carrier managing Class 7 cargo. It is the 3rd largest worldwide liner company for carried containers. 18,000 CMA CGM employees work in the 650 offices throughout the world. This French company owns more than 400 vessels that serve a global network of 170 weekly services. 400 ports of call are encompassed in this network having strong links with all the actors in these ports (authorities and stevedores).

CCLog (CMA CGM Logistics) is the CMA CGM in-house logistics provider. CCLog's mission is to propose added value to the CMA CGM customer supply chains by combining CMA CGM volume of ordinary cargo with the specificities of Class 7 material. Their services include:

- Ship owner acceptance
- Port and canal acceptance
- Loading/unloading & Trans-shipment
- Documentation management
- Vessel planning

Teamwork

The TNI/CCLog partnership is based on strong complementary skills and know-how in domains crucial for success: a solid worldwide network, expert and involved teams on maritime and Class 7 activities, a strategy and a vision shared by the companies, and proven logistics solutions.

Implementation of Class 7 specificities

CCLog and TNI teams have been working on implementing compliance management in response to the requirements of the authorities and to different obstacles:

- Public acceptance, information, training for the opening of ports
  Ex: Ningbo, Port Kelang, Jebel Ali, Khor Al Fakkan
- Regulatory constraints
  Ex: Suez Canal - Documentation, Stowage Plan
- Safety criteria
  Ex: piracy in Aden Gulf

In addition, in response to authority and/or customer demands, CCLog and TNI teams have been working on developing routings across the continents and bringing flexibility to container shipping lines:

- Possibility to change port of call routing or to add a port of call
  Ex: Ningbo and Shanghai
- Possibility to adapt the ship speed
  Ex: Vessel speed acceleration to respect ETA for operational or financial reasons

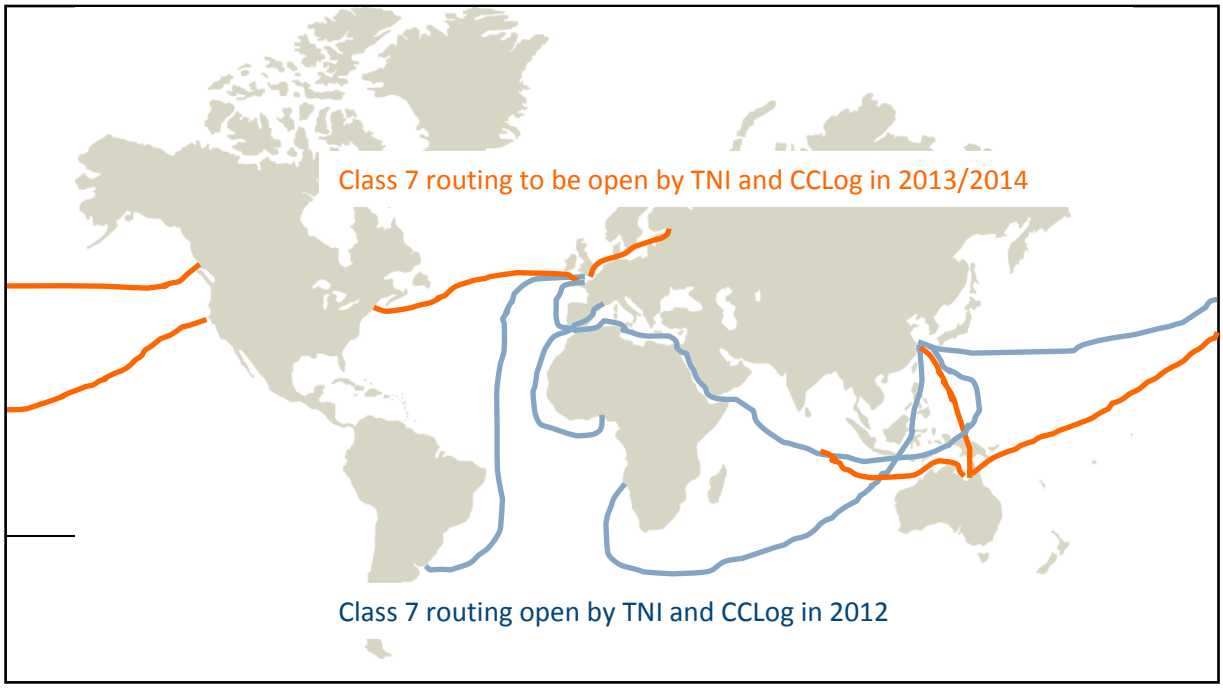

Figure 4: Class 7 routes 2012/2013

A constant focus on safety

By coupling their independent means and know-how, CMA CGM and TNI provide the best possible solutions in the management of safety and security:

- CMA CGM fleet center with real time tracking, operational cell and effective instant positioning with presence of operational ship captain
- TNI Transport Risk Management®, real time tracking, emergency cell, numerous annual crisis management drills, and experts in Class 7 and operational transport linked with the safety authorities

CONCLUSION

The partnership between TNI, with its extensive know-how in Class 7 transportation, and CMA/CGM, one of the largest liner vessel companies with its state-of-the-art equipment, network and solutions, is efficient and advantageous for the entire nuclear industry in that it minimizes risks and optimizes transport of radioactive material.

It is based on good team synergy, a complementary international network, risk management studies, a global and flexible routing solution and, of course, a constant focus on safety and compliance.

This partnership offers a single point of entry for Class 7 solutions and proposes to the customer door to door services with access to multiple assets, and Class 7 expertise with competitiveness as a key driver.