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Conference Paper

An Overview of International Transport of Uranium Concentrates

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Introduction

A Task Force was formed in late 2005 through the World Nuclear Transport Institute (WNTI) to address the common interests of the international commercial producers and converters of natural uranium concentrates. The focus of the UCTF was to discuss common means of complying with the international transport regulations and guidelines [1, 2, 3, 4, 5, 6, 7] as well as to take advantage of other joint industry experience and related published information [8, 9]. Although drummed uranium concentrates have been transported internationally for over forty years, recent developments have created a renewed interest (particularly amongst producers and converters) in sharing industry experience and good practices. In fact the interest of the producers and converters is to share this information beyond the consignors and consignees of the material to the other stakeholders in the transport logistic chain.

The very few commercial natural uranium conversion service providers worldwide are supplied by a larger number of international producers that are spread across the globe. The growing interest in nuclear energy is generating new and increased uranium ore concentrate production worldwide. In the interest of continued safe handling of drummed uranium concentrates, this seemed an opportune time to launch an initiative to share information about industry good practices.

It is understandable that since this is both a narrow field of interest and one that is at the very beginning of the fuel cycle, that many of the other participants in the nuclear fuel cycle would have given little thought to this transport logistic. In the past this logistic has been carried out quietly, economically and with little fanfare or incident. For this reason when the notion to create a task force was raised a number of years ago, the producers and converters themselves questioned the idea. In addition, various stakeholders such as standards organisation representatives, competent authorities and transporters also questioned the concept. Although the idea was raised a number of years ago, it was the discussions that took place in 2004 and 2005 that prompted the converters and some of the principal producers to launch work on the subject through a WNTI task force, the Uranium Concentrates Shipping Task Force (UCTF). Three key topic areas were identified and preliminary papers were prepared to explore them. An initial meeting was held by the UCTF in December 2005 and the papers and plans for how to proceed were discussed. This meeting was followed by four workshops, held over the 2006 to 2007 period. The workshop discussions resulted in the preparation of an Information Paper.

In order to explain what the UCTF Information Paper is all about, this paper is presented in the style of questions and answers. The questions themselves are the ones that as producers and converters we asked ourselves when embarking on this project, as well as the ones that have been posed to the UCTF by other stakeholders. We are taking opportunities such as this to discuss our work more broadly.

What specifically is the cargo?

The scope is limited to drummed natural uranium concentrates that are transported from producers using a marine logistic component combined with ground transport by road and/or rail.

Why such a narrow scope?

The commercial converters are located in North America and Europe and they currently have a number of common requirements for drum characteristics that are related to facility tooling. Significant volumes of drummed uranium concentrates are received by all of the converters from off- shore producers, and once again there are common requirements for the sea (ISO) containers that are related to facility tooling.

Why don't the producers just pick a converter or two and work out tooling specific to their respective facilities instead of taking this approach of common tooling?

Natural uranium concentrate, typically originating from combined mine-mill facilities, is treated as a commodity material. The natural uranium used for fresh fuel is generally purchased by power utilities, which then purchase conversion services. The power utility directs the mine-mill facility to deliver the material to the conversion facility that they have selected. In this sense, it is generally not the producer of the concentrate that decides to which converter it is to be delivered. In other words, the natural uranium concentrates are packaged and when applicable, loaded into ISO containers in a manner that is "universal" and can be handled by any of the recipient conversion facilities.

What is the logistic?

The uranium concentrates are packaged in open head steel drums and they are packed into twenty (20) foot ISO containers. The containers travel by ground via road and/or rail to port, by sea and then finally from the destination port by ground again to the consignee. The ISO containers are almost always leased from shipping lines or container services and then free released back to container pools once they are unloaded. The ISO containers are rarely consignor or consignee owned due to the poor economy in having them back hauled empty.

Why do we need this good practices information to be shared if the packaging and loading is already being handled by the converters?

There are two key reasons for the initiative to take place at this time.

One reason is that industry was recently requested to provide information about industry handling practices for uranium concentrates; in particular, by a principal shipping line that provides the ISO containers for this application. In this sense, providing information to confirm that the containers are being properly and consistently handled by the uranium concentrate industry in this logistic contributes to the industry's ability to readily access ISO containers via their transporters from the ISO container lessors. In other words, this is a matter of sustaining shipments (i.e. avoiding denial and delay of shipments). This is currently a very topical matter for Class 7 (radioactive materials) businesses.

The other reason is that there was a change of regulatory requirements that has been phased in over the last several years. This change is related to new phytosanitary requirements that apply to the securing materials used for these shipments. The changes are driven by adoption by member states of an international convention for plant protection [7]. ISO containers can be readily secured with conventional timber blocking and bracing. Without certified treatment and certification for phytosanitary compliance, this conventional lumber is no longer acceptable for use. Although there are very good alternative securing materials that are phytosanitary compliant, they are not as straightforward to use in such a way that they provide the equivalent restraint. By sharing industry good practices, we hope to reduce the likelihood of problems or non-compliance in these transports.

Apart from these current concerns, some of the transporters involved with this logistic have expressed a longer standing interest in having this information. In their case they deal with obtaining the containers and getting them from the consignor to the consignee, so it is understandable that they have more information themselves. In addition, with this knowledge they can better provide information to the ISO container lessors. In many cases the transporter is the link to the ISO container lessors.

Who is involved in WNTI's UCTF?

All three (3) of the North American and European commercial converters and many of the principal uranium concentrate producers have participated to date. The producers represented are from facilities located in Africa, Australia, Asia and North America.

Who are the stakeholders?

The principal stakeholders are the producers (consignors) and converters (consignees) of uranium concentrates. Other stakeholders include marine transporters, ISO container lessors, ground transporters (road and rail), regulators and modal organisations.

How is the good practices information being made available?

WNTI has published the Information Paper and is making it available at no charge to both WNTI Members and non-members.

What information is included in the publication?

The good practices described in the Information Paper are divided into four areas of interest. The first three were the original scope of the paper and the last one was added during the work of the UCTF:

- the drums used for packaging
- the ISO containers themselves
- restraint of the drums in the ISO containers
- release of the empty ISO containers for return.

Summary and Conclusions

The UCTF having completed the Information Paper now is working on developing further literature related to the transport of Uranium Concentrates. It is also looking at other areas of common interest, such as "blue sky" thinking about ways to continue to develop and improve packaging and handling of these materials. We feel that the sharing of good practices will promote continual improvement as well as leadership in compliance and good product stewardship. Ultimately this contributes to responsibility for the health and safety of workers and the public, as well as the environment.

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