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

EXPERIENCE OF TYPE B(U)F CASK TRANSPORTATION IN GERMANY AND CROSS-BORDER

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ABSTRACT

Contractual agreements were concluded between the German Utilities and the Compagnie Génèrale des Matières Nucléaires (COGEMA, now AREVA NC) in France and BNFL (now INS) in UK for the reprocessing of spent fuel. The delivery of German spent fuel was completely abandoned from June 2005 onwards by an amendment to the Atomic Energy Act in 2001.

Intergovernmental agreements were concluded between Germany and France as well as with UK to ensure and support the reprocessing of spent fuel and its return of to the country of origin.

The return of the generated highly active waste (HAW) to Germany has started in 1996 and will continue in the coming years. Big-sized, self-shielding transport and storage casks manufactured from cask iron or forged steel have been used for transportation. The today's experience on transportation, logistics and public acceptance has been gained from the return of 108 casks each loaded with 28 HAW glass containers from the reprocessing facility in La Hague, France, to the Interim Storage Facility at Gorleben, Germany.

Fig. 1: Interim Storage Gorleben

The industry itself found itself restricted by German security forces who established security requirements for the development of equipment and logistics suitable to transport the maximum granted number of casks per year within one return. The decision on the transport mode and logistics was mainly driven by the security forces in charge. This decision was one of the main drivers to make those transports become a

kind of a one-day-event thus creating a perfect platform for protesters and political parties to demonstrate their anti-nuclear attitude.

As a result, the situation led to a massive impact on intergovernmental affairs, security and safety aspects. Furthermore it affected public life during the transport period and became even violent.

This presentation will elucidate the experience gained during the return transports of the reprocessed waste and will furthermore give some critical thought to the story behind.

INTRODUCTION

On behalf of its shareholders, i. e. RWE AG, E.ON AG, EnBW AG, Vattenfall GmbH, GNS Gesellschaft für Nuklear-Service mbH is acting concerning the return of reprocessing waste from France and UK to Germany. For transportation purposes several contracts have been concluded with the reprocessors and companies competent in nuclear waste transportation matters.

THE CASKS

The return of the waste has been and will be performed by type B(U)F casks called CASTOR® 20/28 CG / CASTOR® HAW28M or TN85. These are big-sized, self shielding transport and storage casks. The design consists of a cylindrical body with cooling fins on the cask surface, two trunnions at the top and bottom ends for handling purposes and a dual lid system comprising a primary and a secondary lid which is covered by a protective plate prior to storage to protect the lid system against mechanical damage. A total maximal heat capacity of 56 kW and a total radioactivity of 1270 PBq are allowed in case of the latest design CASTOR® HAW28M. Protection against neutrons is achieved by two rows of polyethylene rods inserted in the wall of the iron-cast cask body, capsuled graphite columns in the interior of the cask, a polyethylene plate in the bottom area and a multi-part polyethylene plate on the primary lid sealed by a metal sealing as shown in Fig. 2.

Fig. 2: CASTOR® HAW28M

Prior to transport the cask is equipped with shock absorbers to reduce the mechanical load during the transport on public lines in consideration of hypothetical accident conditions. In September 2009 BfS granted legal approval for CASTOR® HAW28M as a package of type B(U)F which is necessary for the cask transport on public lines.

THE TRANSPORT

The today's experience on transportation, logistics and public acceptance has been gained from the return of 108 casks each loaded with 28 HAW glass containers from the La Hague reprocessing facility in France to the Interim Storage Facility at Gorleben, Germany. The industry itself found itself restricted by German security forces who established security requirements for the development of equipment and logistics suitable to transport the maximum granted number of casks per year within one return. The transport of radioactive

material is subject to both radiation protection legislation and nuclear security regulation. The most important requirements for the transport of radioactive materials derive from the UN Model Regulations, the so called Orange Book in accordance with the IAEA safety standards (TS-R-1) which focus on the package that encloses the radioactive content and specifies different transport scenarios, such as routine, normal and accident conditions of transport.

The decision on the transport mode and logistics, i. e. up to 12 casks with one transport was mainly driven by the security forces in charge of the Interim Storage Facility at Gorleben and Lower-Saxony as the federal country in charge of the Gorleben facilities.

This decision was one of the main drivers to make those transports become a kind of a one-day-event thus creating a perfect platform for protests and political parties to demonstrate their anti-nuclear attitude.

The negative side effects of the transport led to a massive impact on intergovernmental affairs, security and safety aspects. Furthermore the situation during transport affected public life and even escalated to violent protests where police forces were attacked with signal ammunition, stones and fire works.

Source: Privat

Source: Focus Online

Fig. 3: Sabotage of the road haulage due to sit-down demonstrations

Consequently, it was necessary to involve different French and German authorities, several reviewers and independent experts in order to guarantee a smooth proceeding of the cross-border and inner-German transport of the HAW-glass containers packed in transport and storage casks from La Hague to Gorleben. Accordingly, the transport organization became very complex, i.e.:

- Implementation of special organization for German/French communication and track control
- Installation of one common control centre in France and one in Germany
- Participation of German authorities and industry representatives in the French and German “Control Centre” during the whole transit
- Implementation of a “Crisis Center”
- Local and national media are present at departure in France

In view of the ongoing return of HAW from La Hague since 1996 a profound knowledge how to handle such a technically demanding and organisationally complex project has been gained until today. Furthermore, continuous anti-nuclear resistance could be faced efficiently by implementing strategically improved safety and security measures.

Licenses and related security requirements

For the performance of a HAW transport in Germany a transport licence is mandatory according to § 4 of the German atomic act. The transport license has to be applied for by the relevant transporter roughly one year in advance prior to the transport itself. The transport license is expected to be issued more than half a year in advance prior to the transport to give the industrial parties and the security forces enough time for implementing the relevant security measures. After approval of the transport licence the transporter has to announce the transport to the federal office for radiation protection (BfS) taking into account a special notification period.

The transport license includes the so called permit of immediate execution “Anordnung der sofortigen Vollziehung”. Furthermore the transport license specifies the additional necessary security measures to be implemented before the transport commences. Security measures for HAW transports in Germany are very special due to the unique situation for such transports in Germany. The security measures are based on best practices and have been developed over several years. An example is the train that is additionally equipped with wagons to carry the necessary security forces. Besides that a special track control is implemented by deploying special devices.

Fig. 4: Rail transport

In addition a special heavy road transport permit has to be applied for the road transport according to § 70 StVZO and to § 29 Abs. 3 StVO (road traffic regulations). This heavy road permit is to be combined with a certificate of exemption because the HAW transports exceed the allowed dimensions and weight for ordinary road transports. All German Federal Lands concerned by the respective HAW transport are in charge of the heavy road transport permit, but finally it will be granted by the Federal Land Authority that is in charge of the respective headquarter of the road transporter. The heavy road transport permit is always issued very

close to the transport itself and additionally includes a permit of immediate execution. Furthermore the heavy road transport involves special security measures prior to and during the transport. Prior to the transport a variety of special checks on the whole transport equipment are to be conducted. All these security checks are attended by the competent police forces in charge. For special protection purposes the truck and all trailers are secured by extra gratings. In order to drive such a truck the drivers are especially educated and trained how to behave in special situations and under certain circumstances.

Fig. 5: Road transport

The basis for the security of nuclear transports in France and in Germany are the regulations of the „Convention on physical protection of nuclear material“ and of the IAEA circular „INFCIRC/225/ Rev. 5, 2011“. [1]

In Germany the directive for the protection of radioactive material against disruptive actions or other interference by third parties („Richtlinie für den Schutz von radioaktiven Stoffen gegen Störmaßnahmen oder sonstige Einwirkung Dritter bei der Beförderung" SEWD-Guideline [2]; also SiRiLi; - classified document) by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety including all its rules and regulations is the standard for developing a conceptual design of protective measures in order to fulfil the security requirements for nuclear transports.
The IAEA circular „INFCIRC/225/ Rev. 5, 2011“ has been implemented in Germany by the SEWD-Directive providing four security categories (Sicherheitskategorie) SK I, SK II, SK III and SK for waste. The decisive factor for the classification is the existing amount of plutonium (Pu_{tot}) per transport.

In contrast to Germany there is no comprehensive body of legislation for performing nuclear transports available in France but a set of laws, regulations and edicts. Based on these documents a further special edict was issued that focuses on the „protection and supervision of spent fuel and nuclear fuel of the security category (SK) III during rail transportation“.

Further activities that may even increase the number of requirements for safety and security

On the 25.01.2012 the state government of Bremen concluded a fundamental change of the harbor law by prohibiting transshipments of nuclear fuel in the harbors of Bremen and Bremerhaven. This basic change may affect the planned returns of vitrified HAW from UK via Bremerhaven to Germany. Currently a case of the CDU parliamentary party is pending at the Constitutional Court of Bremen. Additionally pre-trial proceedings for a breach of contract case are pending at EU level for the same reason. NCS and ANF as well as GNS have submitted a request for a special permit as foreseen in the new harbor law. On the 15.01.2013 the federal land government of Bremen refused the requests from ANF and NCS followed by the rejection of GNS's request on the 27.02.2013. Keeping the term ANF und NCS took an action on the administrative court of Bremen at the 14.02.2013. A respective action by GNS is under preparation.

However, this decision was not motivated by safety or security considerations, but closely followed the decision on the nuclear phase out in Germany in compliance with the intention of Bremen to rely on alternative energies solely.

The decision of Bremen is a precedent as no German seaport has ever been "declassified" for any goods so far. Therefore it cannot be excluded that the use of roads or railroads owned by the Land might also be declassified for specific goods or that the seaports might be declassified in future for other goods such as for instance coal or tropical woods. It was already suggested to the Government of Bremen to declassify the handling of non-nuclear weapons. The decision is a precedent also because other "German Federal Länder" with important seaports on German coasts might follow the example of Bremen.

Conclusion

The return of reprocessed spent fuel as vitrified HAW waste to Germany is covered by a well established bundle of safety and security measures based on the comprehensive body of German legislation. However, a lot of extra measures had to be developed that are not described in any regulation but help to counteract the growing anti nuclear resistance. The examples afore mentioned may be regarded as a "Special German Situation" of civil disobedience. However, who can assure that these anti-nuclear scenes will not happen anywhere else in the future? Therefore an ongoing process on sharing best practices with regards to nuclear transports as an integral part of a continuous improvement of security measures is inevitable to ensure safe and secure nuclear transports also in the future.

Furthermore it can be said that the more institutions (people) are involved the less information can be kept as secrets! Our experience shows that even if the access to information on HAW transports is restricted "transport routes and security measures" are public knowledge long in advance prior to the transport start thus enabling opponents to complete their strategic planning that aims at impeding the transport itself.

The achievement of a high security level due to improved security measures highly depend on the risk that sensitive transport information on timing, routes and security measures will be accessible to unauthorized persons in advance prior to the transport. In order to minimize this risk as few people as possible should have access to the sensitive transport information in order to avoid those undesirable situations as described here for the return of vitrified HAW from France to Germany. It is crucial to differentiate between sensitive transport information on the one hand and the basic information on the waste itself and the necessity of its return and its storage on the other hand. It is important to provide the public with the basic information on the upcoming transport in order to create conditions that the public can understand and preferably accept the return of HAW from abroad.

REFERENCES

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