Challenges with transports of Disused Sealed Radioactive Sources (DSRS).

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Introduction

I have been working in freight forwarding for 20 years and the 10 last ones were dedicated to radioactive materials.

I realized there were huge challenges to transport High Activity sources as Disused Sealed Radioactive Sources (DSRS), most particularly in Europe.

I will show you some of them.

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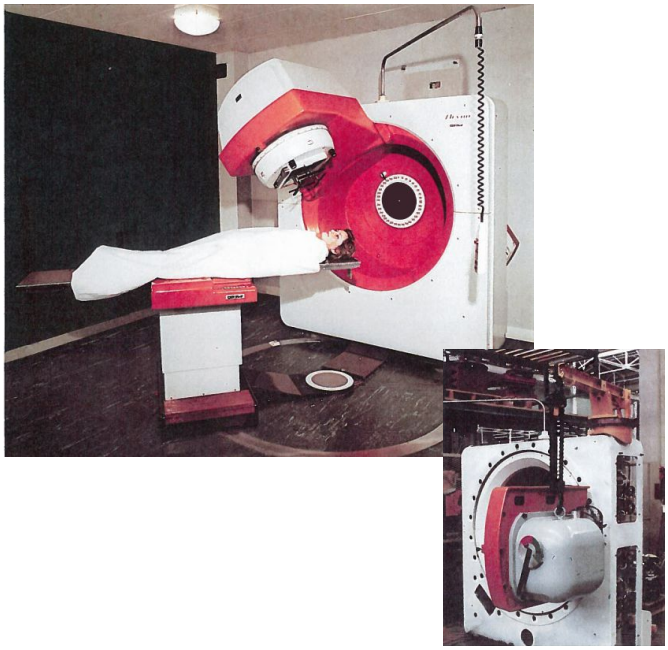
Background

In medical field, devices are used in teletherapy for cancer treatment.
In the devices there are High Activity radioactive sources.

When a radioactive source is no longer in use or not intended to be used (for the pratice for which has been delivered an authorization), it is called *disused*.

Despite their small physical size, radiation emitted from these source is very intense, and requires shielded containers for their safe use, transportation and storage.



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References and Regulations governing transports of radioactive materials

INTERNATIONAL / WORLDWIDE :

International Atomic Energy Agency (IAEA) :
- Code of conduct on the safety and security of radioactive sources
- Regulations for the Safe Transport of Radioactive Material, 2012 Edition – Specific Safety Requirements, IAEA Safety Standards Series No. SSR-6.
- Categorization of radioactive sources,- Safety guide No.RS-G 1.9
- Management of disused sealed radioactive sources, No NW-T-1.3

AIR : Technical Instructions from International Civil Aviation Organization (ICAO) / IATA DGR
SEA : International Maritime Organization (IMO) / IMDG

EUROPE :

ROAD : United Nations Economic Commission for Europe (UNECE) / ADR
RAIL : Intergovernmental Organisation for International Carriage by Rail (OTIF) / RID
INLAND WATERWAYS : United Nations Economic Commission for Europe (UNECE) / AND
+ local Orders or Decree that introduce specific country requirements
HIGHWAY TUNNELS : Frejus / Transmanche / Mont Blanc / Somport

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What have to be transported ?

Radionuclide

Shape and dimensions

Source or device identification

Actual activity

Dose rate

Original Source certificate

+

Recent non-leaking test certificate

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What have to be transported ?

Radionuclide

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!

Device might content Depleted Uranium

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How will it be transported ?

Transport package
-
Type B(U)

Approx 16m3
6 000 / 12 000 kg

Approx 2m3
530 / 2200 kg

Approx 2,70m3
1600/4600 kg

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How will it be transported ?

Transport package
-
Type B(U)

Type B(U) certificate

- Permissible radioactive content
- Permissible transport mode
- Other important informations as : technical description, notice of use, and off course its validity

Source or device

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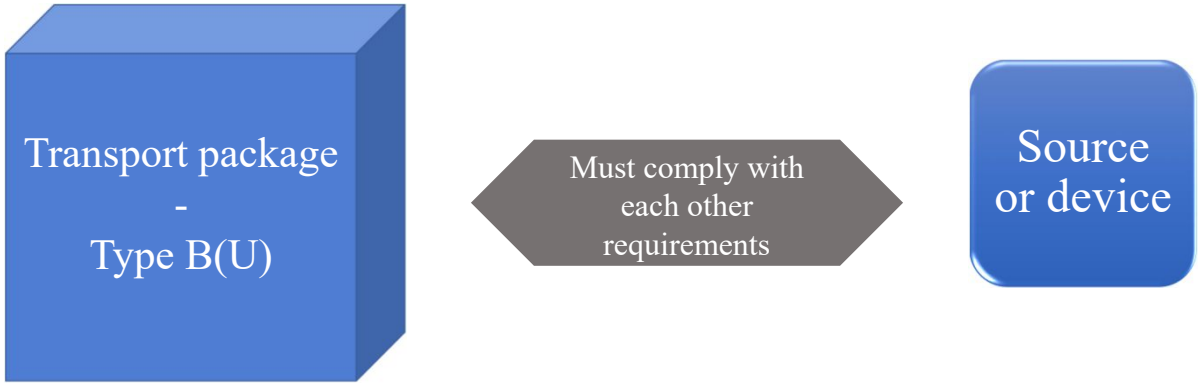
How will it be transported ?



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Challenges in Europe

PREMICES :

Europe is a continent made up of 56 countries, its area is around 10 million square kilometers (about 1/4 of the area of Asia or America).

European Union (initially named European Economic Community 1958).
Today the EU counts 28 countries members of the political-economic association and others are candidates to join the EU.

In 1995, some countries (EU members or not) signed the Schengen agreement. The agreement implies, among other things, the disappearance of border controls.

We would think that it simplifies transports in Europe, but not really ….

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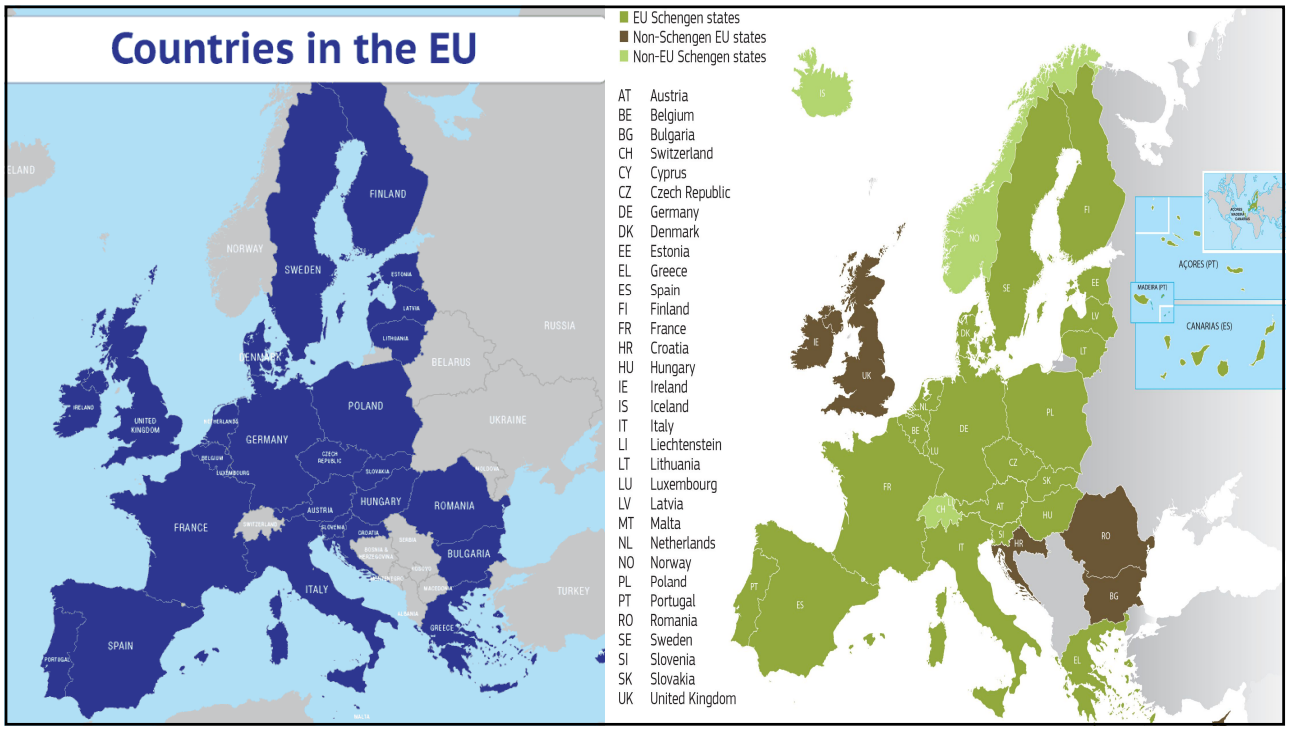

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Challenges with road transport permits in Europe

- Registration to Competent authority
- Transport permit for radioactive materials
- Transport permit dedicated to the specific transport

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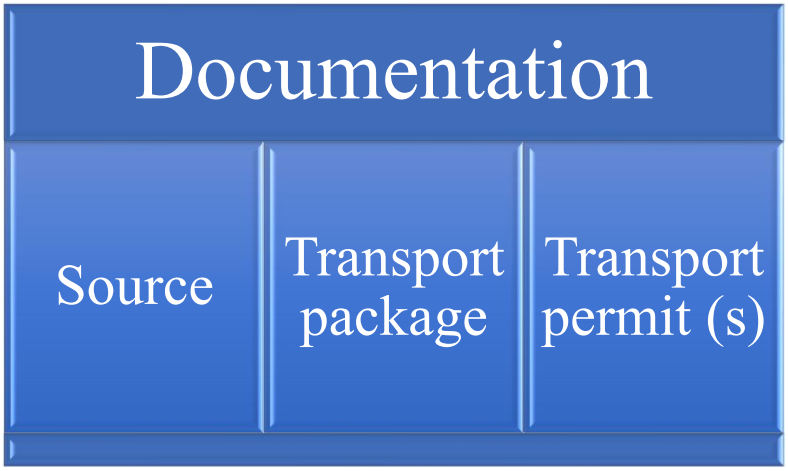
Challenges with documentation



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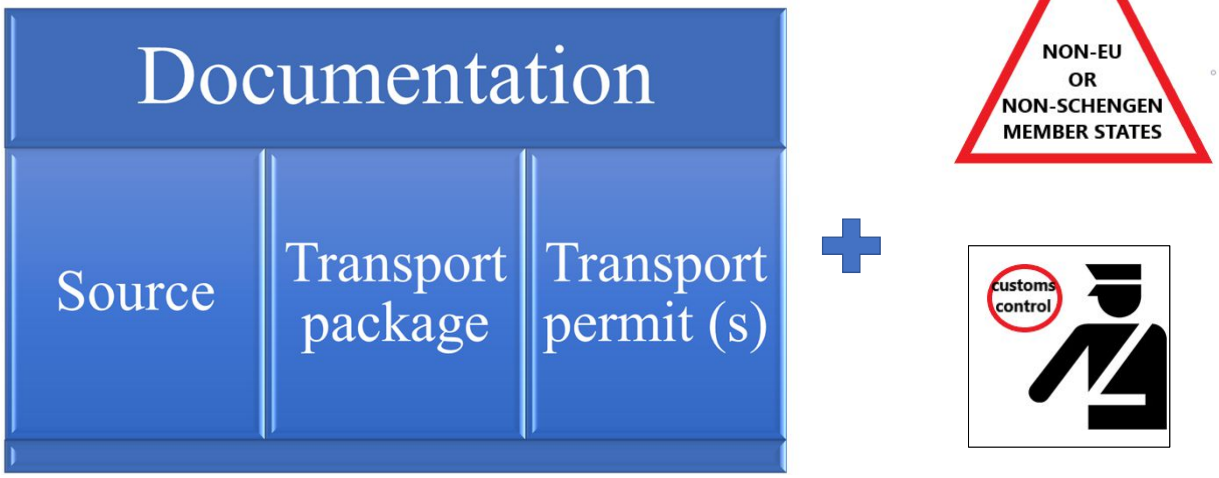
Challenges with documentation



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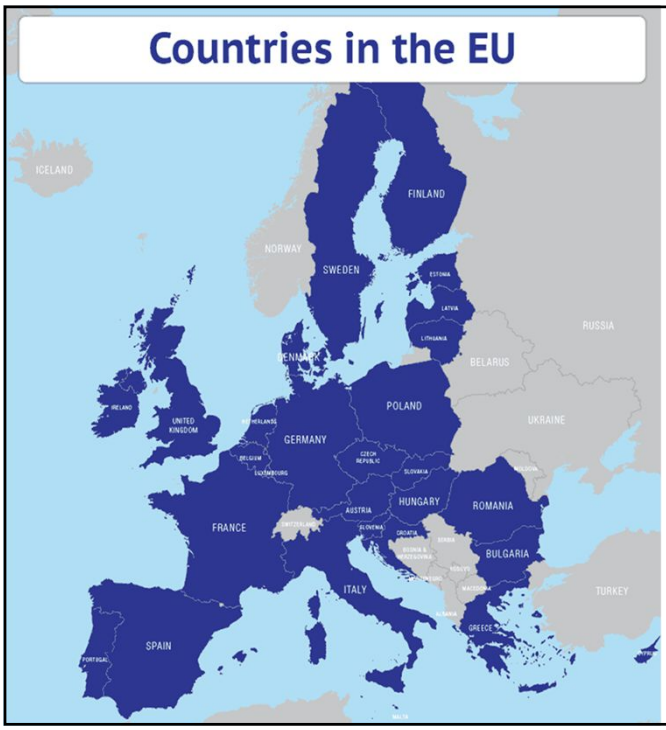

Examples

- France / Belgium
- Sweden / Germany
- Montenegro / France

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Challenges with transports by air in Europe

Air transport could be an alterative to road transports.

Between France and « furthest » countries as Greece or Finland there are only around 3 000 km by road, so by air it is considered as short-distance flight, BUT

- Few airlines accepts radioactive materials
- For short distance flight, there are mostly small aircraft and they don't have payload capacity

So it is almost impossible to ship on regular airline into Europe.

We could imagine that airlines could do « surface flight », but not at all, they cannot manage with radioactive materials in their truck.

So the last possibility to ship by air would be by chartering an aircraft, but as you know this solution is really not cost-effective, and it is usually the last studied possibility.

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Experiences

Despite the closeness of the countries, it is not as easy as we could imagine to transport DSRS in Europe.

What irony when I observed that it is more convenient to transport DSRS from non-European countries !
Here few examples :

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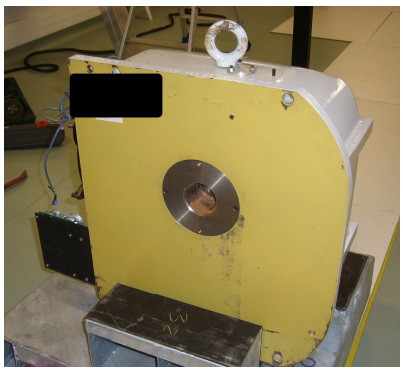

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Conclusion

European and International transport of DSRS is not easy but not impossible.

It requires to take into consideration several aspects as dangerous goods transports regulations, customs regulations, local specific regulations and also technical aspects.
But all these constraints should not discourage us

I have a phrase that helps me to keep heading :

Organization is 50 % of a job well done.

No matter if we are a trucking company, a transport package manufacturer, or a freight forwarding company, an airline or any link in the transportation chain, we all should increase our cooperation to streamline the process and enlarge our contribution to maintain a high level of safety and security of radioactive sources.

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THANK YOU FOR YOUR ATTENTION.

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