

REINFORCED PROTECTION OF VEHICLES USED FOR THE SHIPMENT OF SENSITIVE NUCLEAR MATERIAL

Assessment and approval

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International Maritime Organisation,
4, Albert Embankment - London

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Reinforced Protection of Vehicles used for the Shipment of Sensitive Nuclear Material

- ❑ **Protecting sensitive nuclear material:**
 - ❑ Sensitive material?
 - ❑ Major requirements; guidance features; regulations
 - ❑ Role played by IRSN

- ❑ **Conditions of approval of vehicle physical protection**

- ❑ **French process:**
 - ❑ Assessment process; role attributions
 - ❑ Control and inspection

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What is considered as most sensitive material?

Material	Category I		Category II	
	INFCIRC 225/rev.4	French regulations	INFCIRC 225/rev.4	French regulations
Plutonium Uranium-233	≥2kg		≥500g	≥400g
Uranium-235 U enrichment ≥ 20%	≥5kg		>1kg	
Uranium-235 20% > U enrichment ≥ 10%			≥10kg	≥5kg
Irradiated fuel			Radiation level ≥ 1Gy/h at 1m unshielded	

Security guidance for category I material transports (excerpts)

■ INFCIRC/225 rev.4

- 8.2.2. Advance authorization
- 8.2.3. Mode and Route approval from the competent authority
- 8.2.8. Communication, notably with a transport control centre
 - For shipments by road, rail or sea, there should be a transport control centre keeping track of the current position of the shipment
 - Keeping track of the security status of the shipment
 - Alerting response forces in case of attack
 - Maintaining continuous two-way communication
 - Protected against intruder
 - Staffed by qualified shipper or State's designees, whose trustworthiness has been predetermined
- 8.3.2.1. Designated load vehicles specially designed to resist attack

■ French regulations

- Extend these obligations to all cat I and II materials
- Designates IRSN as the technical support organization, housing the national transport control centre (a.k.a. EOT)

IRSN role and major missions in sensitive transport security

1. The national transport control centre (EOT) is:

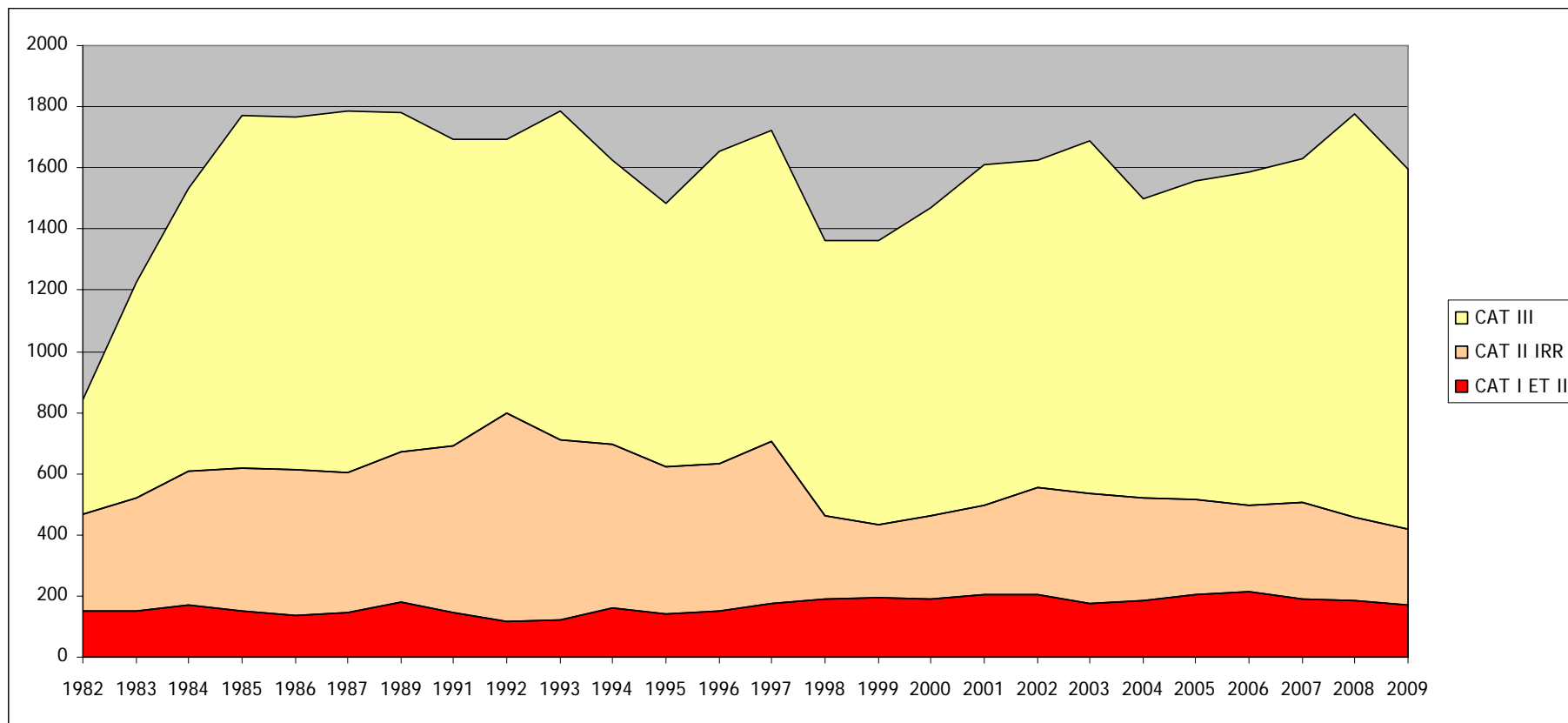
- Housed
- Manned
- Secured
- Maintained

by IRSN

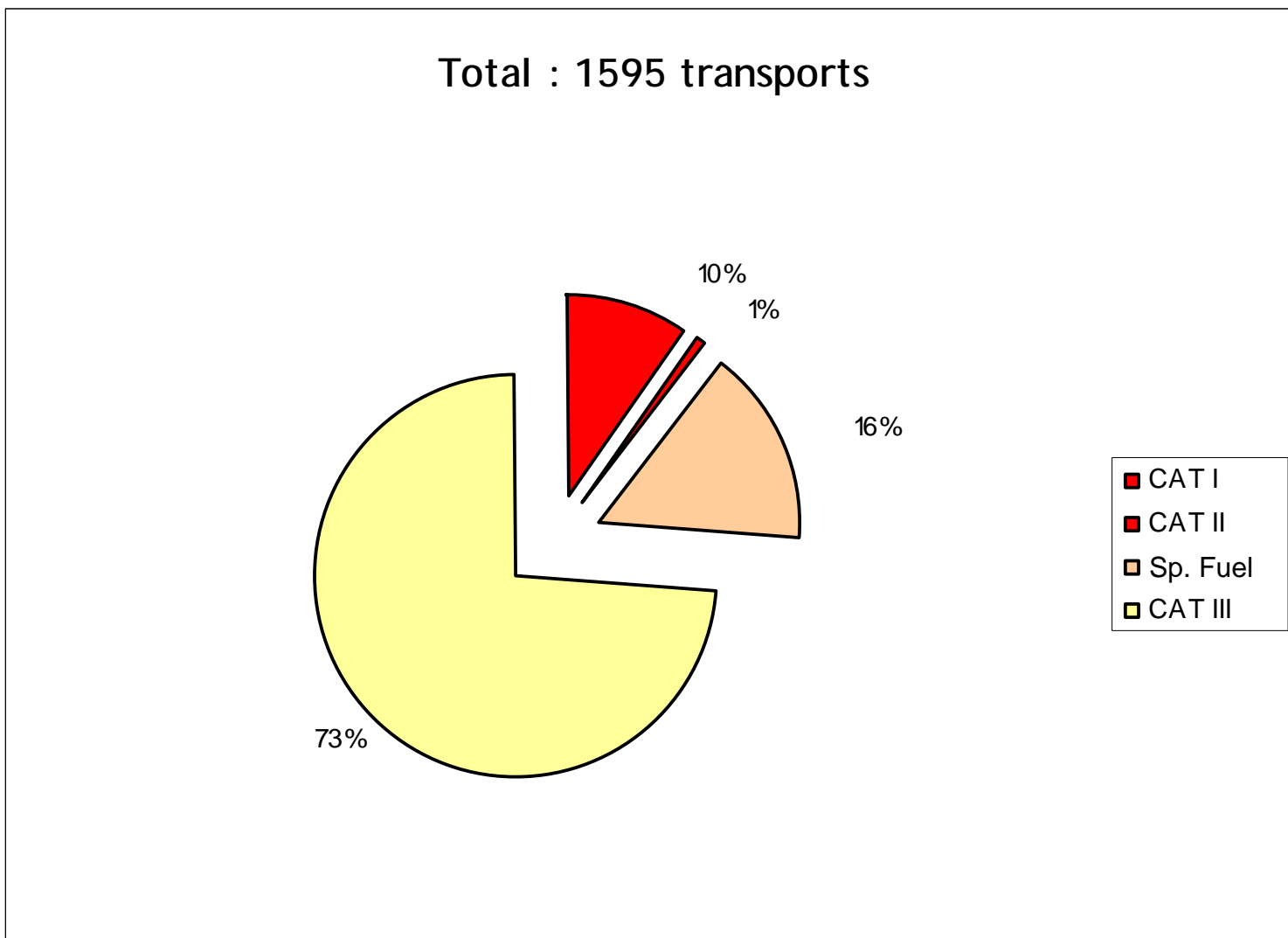
2. IRSN brings technical support and expertise to the competent authority regarding assessment of vehicle protection and provisions

- Communication
- Physical protection provisions
- Etc.

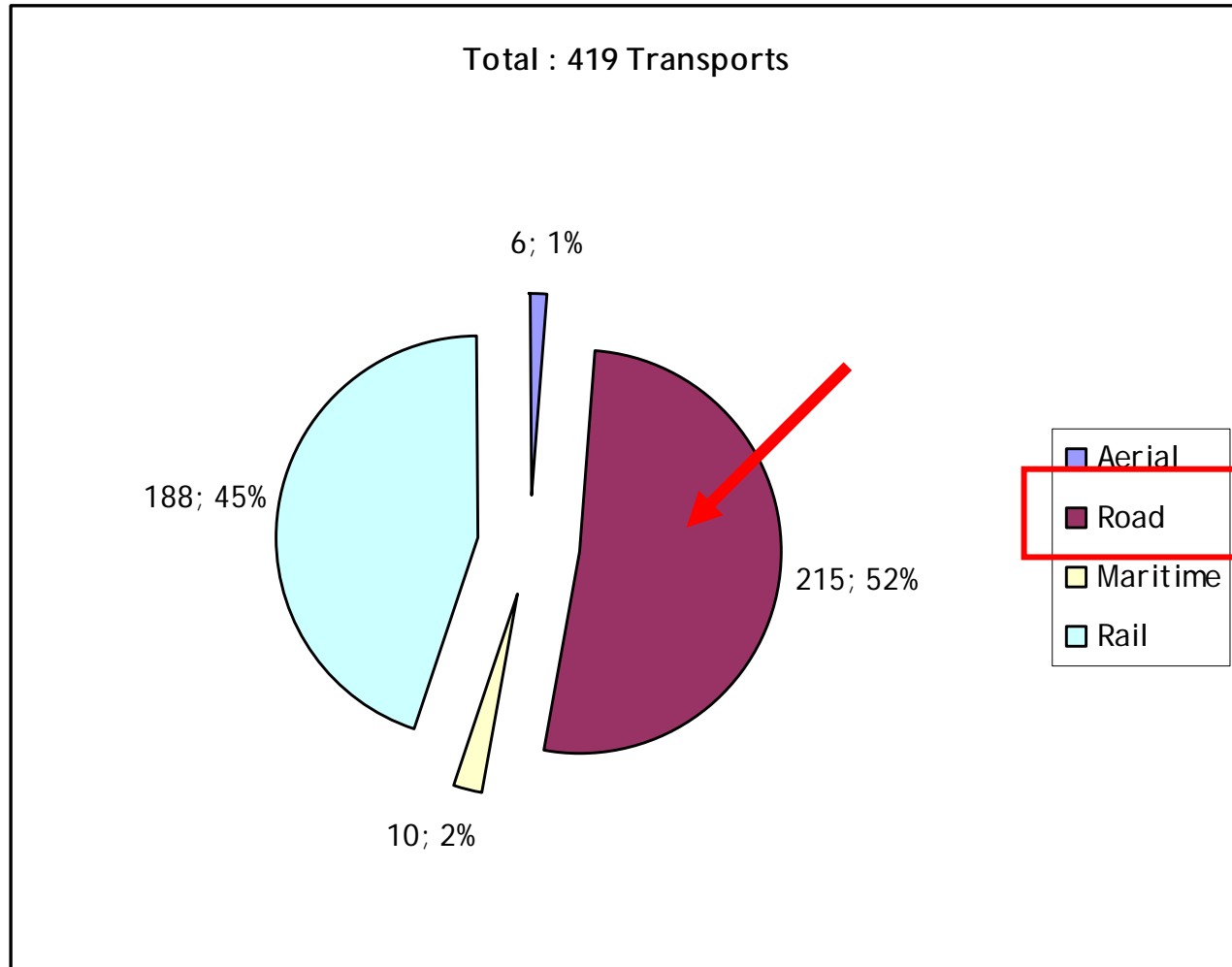
Number of transports followed by the IRSN Control Centre since 1982



Year 2009



Cat I and II shipments: mode of transports (2009)



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Specifications edited by the French authority

- **Protection of the vehicle**
 - Maintain the vehicle operational as long as possible in case of an attack
- **Protection of the driver**
 - Id.
- **Anti removal**
 - Resistance to intrusion
 - Prevent from moving the vehicle and removing the cargo if the vehicle is forced to immobilize
- **Tracking system**
- **Communication**
 - Secured, redundant

Illustrations...

CADILLAC ONE: THE CAR THAT THINKS IT'S A TANK

PETROL TANK: Armour-plated and filled with a specially designed foam which prevents it from exploding even if it suffers a direct hit.

REAR COMPARTMENT: Seats four passengers with glass partition - only Obama has a switch to lower it. Windows larger than on previous presidential cars. Panic button installed for Obama to summon help.

DOORS: Armour-plated, eight inches thick and the weight of a cabin door on a Boeing 757 jet.

CHAUFFEUR: Trained by CIA to cope in the most demanding of driving conditions.

DRIVER'S WINDOW: Tough enough to withstand armour-piercing bullets. The only window that opens - by just three inches - so the driver can pay a toll or talk with secret service agents running alongside.

BODYWORK: Combination of dual hardness steel, aluminium, titanium and even ceramic to break up possible projectiles.

DRIVER'S COMPARTMENT: Standard steering wheel, but dash board contains a communications centre and GPS tracking system.

BOOT: Holds oxygen supply and a firefighting system.

REAR SEATS: Obama's seat has an executive package featuring a foldaway desktop, laptop computer with wi-fi, state of the art satellite phone and direct line to the vice president and the Pentagon.

DEFENCE ACCESSORIES: Equipped with night vision cameras and pump-action shotguns. Also armed with tear gas cannons. Bottles of the president's blood kept on board in case he needs an emergency transfusion.

CHASSIS: A reinforced five inch steel plate runs under the car for protection in the unlikely event of a bomb being placed underneath.

TYRES: Kevlar-reinforced, shred and puncture-resistant, with steel rims underneath, enabling the car to escape at speed even if tyres are blasted away.

FACTFILE

- Price: £300,000
- Length: 18ft
- Height: 5ft 10in
- Engine: 6.5 litre diesel engine.
- Max speed: 60mph.
- 0-60mph: 15secs
- Fuel consumption: About eight miles to the gallon.

The unfinished Cadillac under test this week

Graphic by John Lawson

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Resistance to intrusion

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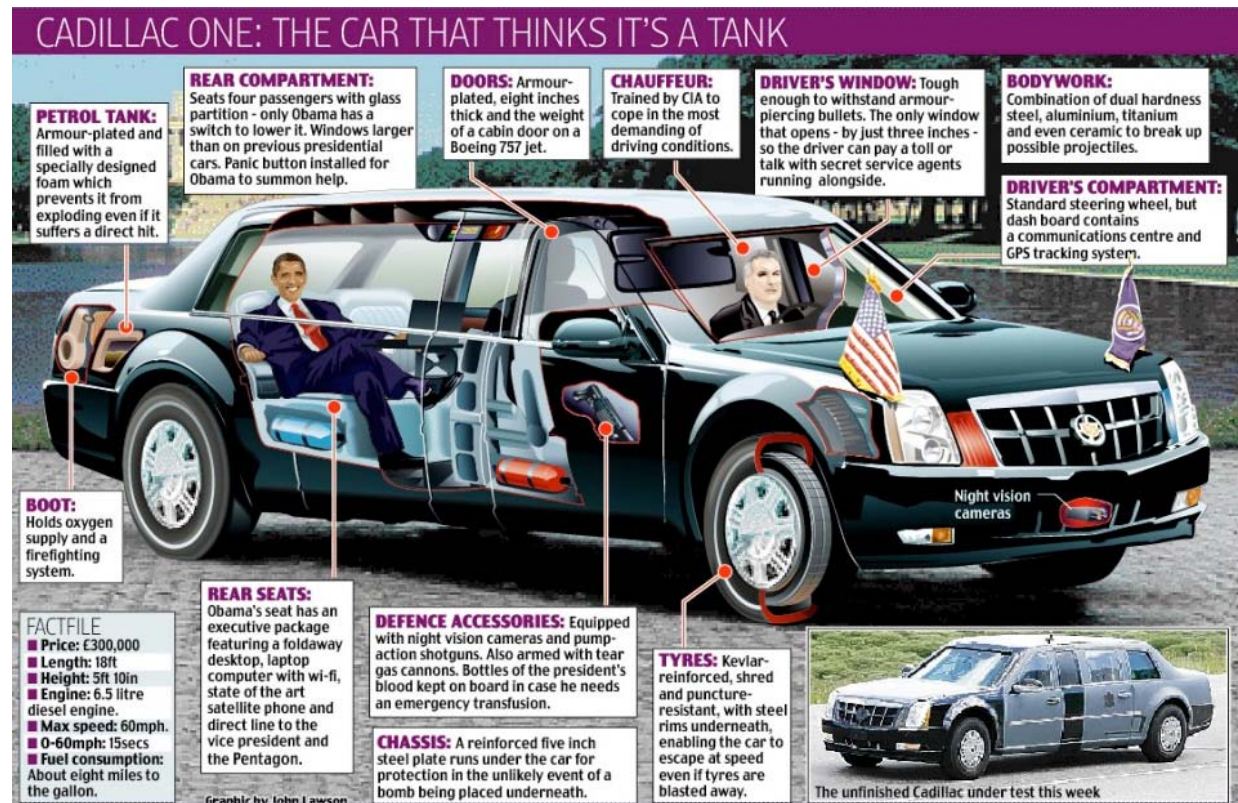
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Specifications edited by the competent authority

- Protection of sensitive « cargo » -- whatever the cargo is -- during road shipment requires specific design of vehicles, but are always based on the same principles

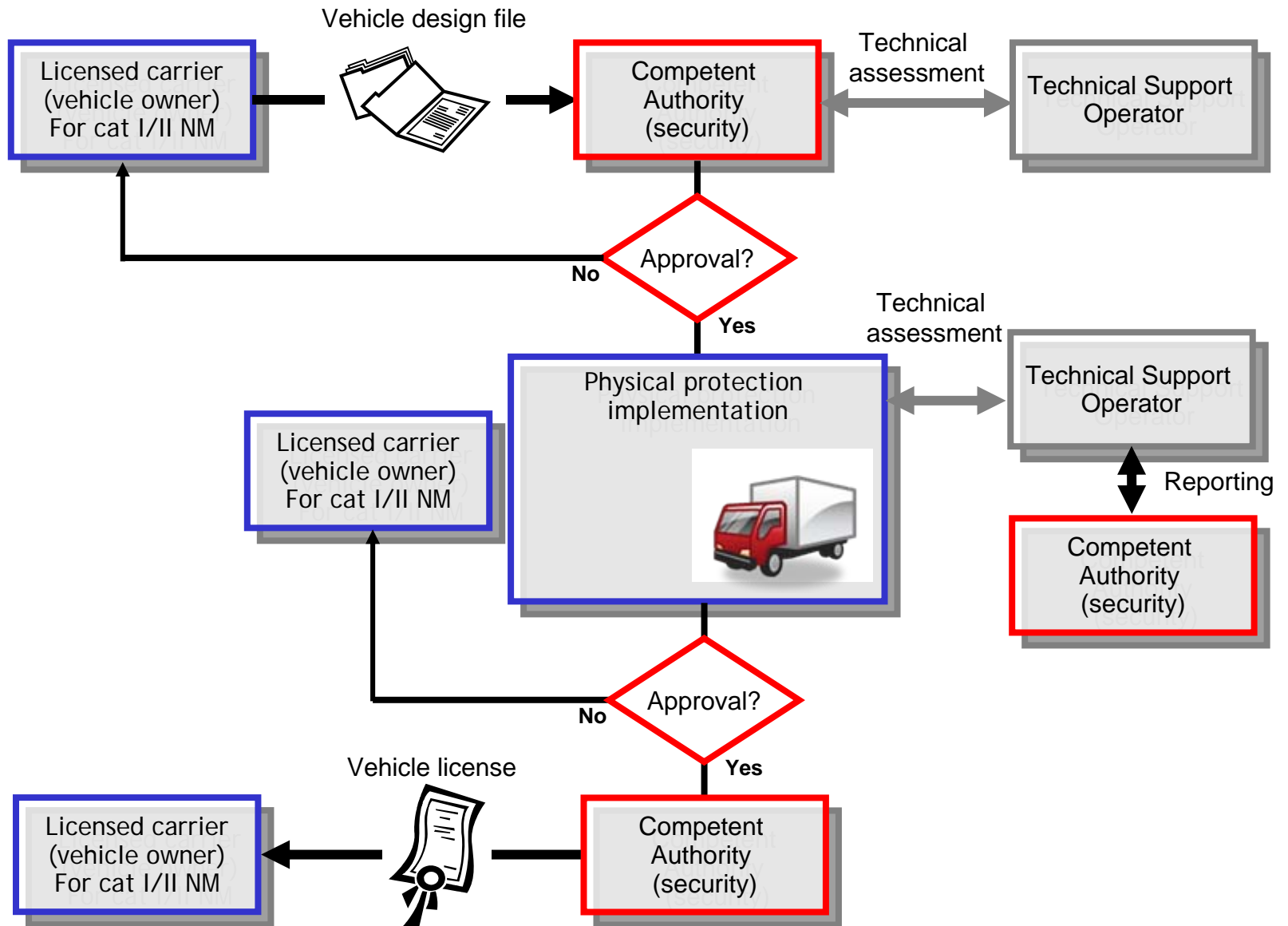


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Vehicle approval process

- **Involved entities**
 - Authorized Shipper (applier)
 - Authority
 - Technical Support Organization



Control and inspection

- **Authorized shipper is responsible for**
 - Maintenance of the physical protection
 - Securing the vehicle when uncharged
- **Communication and alarm tests are required by the Competent Authority (through the Control Centre) prior to every transport**
- **Any modification implies a submission to the competent authority for approval**
- **Competent authority inspectors check**
 - Vehicle physical protection status and efficiency yearly
 - Compliance with the certification
 - Detect any unauthorized modification

Inspection major figures

- Inspectors trained for physical protection checks and tests on vehicles (IRSN)
- Technical control of licensed material
 - Check the conformity with the license file
 - Report addressed to the competent authority
- In case of major malfunction, the license is suspended
- Frequency
 - Cat I et II non irradiated
 - 37 vehicles and containers controlled every year
 - Cat II irradiated
 - 96 vehicles and containers controlled once every 3 years
 - Only a few temporary license suspensions for system repair after unsatisfactory control in 2009 and 2010



Summary

- **Competent Authority delivers license for secured and protected vehicles for shipment of sensitive nuclear material**
- **License is delivered on the basis of:**
 - For each vehicle, the shipper submits an application file expected to meet the regulatory technical specifications
 - Technical assessments and verifications cover
 - Design files
 - Implementation process
- **Once the license is granted**
 - The authorized Shipper is responsible for maintenance and physical protection
 - Inspectors check vehicle physical protection status and efficiency once per year; License is at stake
- **A modification of any kind implies official approval of the authority**

Conclusions

- An integrated process to participate in and to ensure a better security of sensitive material during transport
 - Starting with the first design steps
 - Continues all along the use of the vehicle

Thank you for your attention !

Contact: Olivier Loiseau

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Enhancing nuclear safety

