

AVON AND SOMERSET LOCAL RESILIENCE FORUM INDIVIDUAL RISK ASSESSMENT (V2.0)

Avon and Somerset Local Resilience Forum Risk Assessment Working Group

Individual Risk Assessment Lead Agency:

Avon Fire & Rescue Service

Hazard / threat category:	Sub-category:
Transport accidents	Local accident involving transport of hazardous chemicals
Hazard and threat description, including scale:	Risk reference no.:
<p>Transport accident involving hazardous goods:</p> <p>a) HL12 – up to 50 fatalities and up to 500 casualties (direct injuries from the accident would be similar to road or rail accidents; indirect casualties are possible, if substance covers wide area). The extent of the impact would depend on the substance involved, quantity, nature and location of accident. The assumption is based on phosgene / chlorine;</p> <p>b) L16 – incident spread beyond a 500m cordon with more than 5 fatalities and/or 20 hospitalisations, evacuation beyond the cordon; or</p> <p>c) L17 – incident contained within a 500m cordon, up to 5 fatalities and/or 20 hospitalisations, advice to shelter but no evacuation beyond the cordon.</p>	TA/7
Date of revision:	Next review date:
January 2008	January 2009

1. Overview of hazard or threat

Hazardous materials are continually transported by road, rail, air and water throughout the United Kingdom. Many hazardous materials loads are transported by road in tankers and other containers and the Avon and Somerset area has approximately 232 miles of motorway carriageway and many more miles of major trunk roads along which such loads frequently travel. Hazardous materials are also transported through the area by rail. Defence nuclear assets are also transported by road, rail and air through the Avon and Somerset area.

Accidents involving such loads may cause fire, explosion, adverse acute/chronic health effects, a threat to public health and environmental damage. Depending on the location of the incident, an incident may also require members of the public to be evacuated or advised to shelter indoors with doors and windows closed.

2. Key historical evidence

Hazardous materials transportation

- A19 chemical tanker incident, 19 February 1996. Two tankers, one carrying nitrobenzene and one carrying diesel, collided on the A19 in Teesside. Both drivers were injured and a fire ensued with escaping products causing significant environmental contamination. Initial clearance of the roadway took four days and it took more than a month to decontaminate the affected drainage systems and stream.
- 16 May 1991: derailment of goods train carrying flammable liquids at Bradford-on-Tone, Wellington, Somerset. Goods train derailed and caught fire, 14 of 18 tank carriages were involved, fire took two days to fully extinguish, Fire and Rescue Service presence at incident for seven days. Environmental impact to site was major, site is yet to fully recover from the incident and pollution.
- On 27 December 1997, a train carrying VCM (an explosive toxin needed to make vinyl) overturned just outside Barry in South Wales. Around 1,000 people had to be evacuated from their homes in the surrounding area, and spent the best part of three days in temporary accommodation.

Reference: Home Office Emergency Planning College (2001) Major Highways Incident Workshop course materials.

Nuclear material transportation

- UK incidents involving the transport of civilian nuclear assets
 - During 2004 there were 20 accidents and incidents involving the transport of radioactive materials from, to or within the UK. None of these reported events involved significant radiological consequences. There were no events involving excess contamination on irradiated nuclear fuel flasks. In total, 806 events involving the transport of radioactive materials are known to have occurred since 1958.
- UK incidents involving the transport of defence nuclear assets
 - August 1977 – Coulport – handling incident involving Polaris missile while being hoisted onto submarine; no damage to missile or warhead.
 - August 1983 – Glasgow – road traffic accident; minor damage to vehicle; no damage to warheads.
 - January 1987 – Wiltshire – road traffic accident; Truck Cargo Heavy Duty (TCHD) skids off icy road and overturns; no damage to warheads.

Reference: Defence Logistics Organisation – Nuclear Movements and Nuclear Accident Response Group (2004) Nuclear Accident Procedures Course (Transport) course materials.

3. Likelihood

Hazard	Outcome description	Likelihood
Transport accident involving hazardous goods	Up to 50 fatalities and up to 500 casualties (direct injuries from the accident would be similar to road or rail accidents; indirect casualties are possible, if substance covers wide area). The extent of the impact would depend on the substance involved, quantity, nature and location of accident. The assumption is based on phosgene / chlorine	Negligible (1) (National assessment – Department for Transport)
Transport accident involving hazardous goods	Incident spread beyond a 500m cordon with more than 5 fatalities and/or 20 hospitalisations, evacuation	Unlikely (3)

NOT PROTECTIVELY MARKED

	beyond the cordon	
Transport accident involving hazardous goods	Incident contained within a 500m cordon, up to 5 fatalities and/or 20 hospitalisations, advice to shelter but no evacuation beyond the cordon	Possible (4)

4. Impact

Summary

Hazard	Outcome description	Impact	
Transport accident involving hazardous goods	Up to 50 fatalities and up to 500 casualties (direct injuries from the accident would be similar to road or rail accidents; indirect casualties are possible, if substance covers wide area). The extent of the impact would depend on the substance involved, quantity, nature and location of accident. The assumption is based on phosgene / chlorine.	Health:	Significant (4)
		Social:	Significant (4)
		Economic:	Significant (4)
		Environment:	Significant (4)
		Overall:	Significant (4)
Transport accident involving hazardous goods	Incident spread beyond a 500m cordon with more than 5 fatalities and/or 20 hospitalisations, evacuation beyond the cordon.	Health:	Moderate (3)
		Social:	Moderate (3)
		Economic:	Moderate (3)
		Environment:	Moderate (3)
		Overall:	Moderate (3)
Transport accident involving hazardous goods	Incident contained within a 500m cordon, up to 5 fatalities and/or 20 hospitalisations, advice to shelter but no evacuation beyond the cordon.	Health:	Moderate (3)
		Social:	Minor (2)
		Economic:	Minor (2)
		Environment:	Minor (2)
		Overall:	Minor (2)

Details

Impacts associated with transport accidents involving hazardous materials:

Primary:

Physical harm and injury: trauma from the collision, burns and smoke inhalation from any subsequent fire, adverse health effects from the toxic properties of the hazardous material (varying degrees of severity, including death).
 Damage to property, including road surfaces / railway infrastructure.
 Evacuation and temporary accommodation needs.
 Environmental pollution from escaping product or any associated fire.
 Environmental pollution from firefighting operations (eg foam, firefighting water run-off).

Secondary:

Loss of economic income.
 Safety assessments, possible re-surfacing of roadways.
 Environmental remediation and clean-up.
 Temporary impact on transport infrastructure (eg road closures or restrictions on use of railways as safety precautions).
 Need for public information.
 Reduced availability of fire and rescue resources for routine emergency cover.
 Loss of public confidence in the ability of the authorities to deal with incidents (particularly concerning transport accidents involving nuclear materials).

5. Vulnerability and resilience

Considerable potential exists for transportation incidents involving hazardous materials within the Avon and Somerset area. Significant controls are in place to ensure statutory compliance with legislative requirements to prevent accidents happening and for responding to them effectively if they do.

6. Overall assessment

Category:	Sub-category:		
Transport accidents	Hazardous goods transport (eg fuel, nuclear)		
Outcome description	Impact	Likelihood	Risk
Up to 50 fatalities and up to 500 casualties (direct injuries from the accident would be similar to road or rail accidents; indirect casualties are possible, if substance covers wide area). The extent of the impact would depend on the substance involved, quantity, nature and location of accident. The assumption is based on phosgene / chlorine.	Significant (4)	Negligible (1)	MEDIUM
Incident spread beyond a 500m cordon with more than 5 fatalities and/or 20 hospitalisations, evacuation beyond the cordon.	Moderate (3)	Unlikely (3)	HIGH
Incident contained within a 500m cordon, up to 5 fatalities and/or 20 hospitalisations, advice to shelter but no evacuation beyond the cordon.	Minor (2)	Possible (4)	MEDIUM

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Controls in place:

- Compliance with: (a) the Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2004; (b) the Carriage of Dangerous Goods by Rail Regulations 1996; (c) the Packaging, Labelling and Carriage of Radioactive Material by Rail Regulations 2002; (d) the Radioactive Material (Road Transport) Regulations 2002; (e) IAEA Regulations for the Safe Transport of Radioactive Materials 1996 (Revised) TS-R-1; (f) Air Navigation (Dangerous Goods) Regulations 1994; (g) Merchant Shipping (Dangerous Goods and Marine Pollutants) Regulations 1990.
- Placarding of hazardous materials loads. All GB-registered road and rail vehicles on domestic journeys must display the relevant Emergency Action ('Hazchem') Code. All other vehicle must display the Hazard Identification Number.
- Information retrieval schemes and availability of expert advice: TREMCARDS, placarding, CHEMSAFE scheme, Met. Office CHEMET scheme, availability of expert advice via Fire and Rescue Hazmat Officers and local authority Scientific Services.
- Railways: availability of Total Operations Processing System (TOPS); dangerous goods trains and trains carrying passengers are not allowed in the Severn Tunnel at the same time.
- Transportation of nuclear material: civilian – RADSAFE scheme; military – Nuclear Movements & Nuclear Accident Response Group (NM&NARG).
- Fire and Rescue Service: bulk foam plans, Environment Agency 'grab-packs' and Environmental Protection Unit for pollution control, Environment Agency-Fire and Rescue Service Memoranda of Understanding on environmental protection, mutual aid reinforcement schemes, New Dimension mass decontamination and Hazardous Detection, Identification and Monitoring (H-DIM) capabilities.
- Ambulance Services: decontamination teams for contaminated casualties.
- Local authorities: generic emergency plans (eg evacuation and rest centre plans).
- Highways Agency: incident response plans.

Additional risk treatment required:

- None identified.

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