No. RW//NH-12024/SOP Tunnel/Zone-II/2019

Government of India

Ministry of Road Transport &Highways

(Zone-II)

Transport Bhawan, 1, Parliament Street, New Delhi - 110001

Dated: 28.02.2020

Office Memorandum

Sub.:Standard Operating Procedure (SOP) for passage of vehicles carrying hazardous material through Chenani-Nashri tunnel (Dr. Syama Prasad Mookerjee Tunnel)-reg.

I am directed to forward herewith the Standard Operating Procedure (SOP) for passage of vehicles carrying hazardous material through Chenani-Nashri tunnel (Dr. Syama Prasad Mookerjee Tunnel).

2. This issues with the approval of competent authority.

Encl.: As above

(Pramod Kumar)
Assistant Engineer (Zone-II)
for Director General (RD)& Spl. Secretary

To

i) The Chairman,
National Highways Authority of India,
G-5&6, Sector-10, Dwarka, New Delhi-110075
ii) NIC, MoRTH, New Delhi-It is requested to upload the SOP on Ministry's website.

Copy for information to:

i) Secretary, Deptt of Chemicals, New Delhi (email: sec.cpc@nic.in)
ii) The Secretary, Ministry of Petroleum & Natural Gas, New Delhi (email: sec.png@nic.in)
iii) The Director General (BR), BRO, New Delhi (email: bro-dg@nic.in)
iv) Sh. V.K. Rajawat, Director(T), NHIDCL, New Delhi

Copy for internal circulation to:

(i) PS to Hon'ble Minister (RT&H)/PS to Hon'ble MoS(RT&H)/PPS to Secretary (RT&H)/ PPS to DG(RD)&SS/PPS to ADG.
(ii) All JS's, MoRTH.
(iii) All CE's MoRTH

STANDARD OPERATING PROCEDURE FOR PASSAGE OF VEHICLES CARRYING HAZARDOUS MATERIAL THROUGH CHENANI - NASARI TUNNEL

General

1. Chenani - Nasari Tunnel is a road tunnel in Jammu & Kashmir on NH 44 (former name NH 1A). It is India's longest road tunnel with a length of 8.983 Km, which was completed on 08 Mar 2017. The tunnel has reduced the distance between Jammu and Srinagar with a reduction of approx two hours travel time. The all weather tunnel bypasses snowfall and avalanche prone areas in winter at places like Patnitop, Kud and Batote that obstruct NH 44 every winter.

2. **Design Characteristics of Chenani - Nasari Tunnel.**

(a)	Length	-	8.983 Km (Bi-Directional).
(b)	Escape Tunnel Length	-	8.983 Km (Parallel to main Tunnel).
(c)	Carriageway width	-	Main Tunnel - 9.35m Escape tunnel - 5.5m

(d) The detailed design characteristics of Chenani-Nasari Tunnel are at Appendix 'A' attached.

3. Alongwith normal traffic, passage of hazardous goods may also have to be transported through the tunnel. A serious incident involving fire/ explosion while carrying hazardous/ dangerous goods through the tunnel can lead to disastrous consequences for human lives, equipment and damage to the tunnel, causing avoidable disruption to traffic. Since a complete ban on passage such goods through tunnels is neither desirable nor warranted, there is a need to regulate such traffic through an institutionalised mechanism/ procedure.

Aim

4. To formulate a Standard Operating Procedure (SOP) to regulate passage of hazardous/ dangerous goods through Chenani - Nasari Tunnel.

Scope

5. The Scope of this SOP is as under:-

(a) Likely hazards that may occur due to passage of dangerous goods through tunnels.

(b) Classification of Hazardous/ Dangerous Goods.

(c) International Conventions.

(d) Mitigation Techniques.

(e) Action by Tunnel Controlling Authorities.

(f) Obligations of Transporters and Drivers.

Contd...P/2.

(g) **References**. The following references have been consulted while making this SOP:-

(i) UN Regulations/ USA Regulations/ European Regulations.

(ii) Joint Research Report by OECD, PIARC & European Commission on "Transport of Dangerous Goods through Road Tunnel - Safety in Tunnel".

(iii) Ministry of Environment and Forests Notification GSR 523 dt 08 Jul 2011.

(iv) The Hazardous Substances (Classification Packaging and Labelling) Rules, 2011.

(v) The Central Motor Vehicle Rules, 1989.

(vi) Petroleum and Natural Gas Regulatory Board Transport Regulations.

(vii) Petroleum Rules 1976 Schedule III.

Likely Hazards That May Occur During Transit of Hazardous/ Dangerous Goods Through the Tunnel

6. **Likely Hazards**. The likely hazards that may cause extensive damage inside a tunnel are as follows:-

(a) **Explosions**. Explosions can have a devastating effect inside a tunnel. Levels of explosions can be classified as under:-

(i) **Very Large Explosion**. These are explosions that are typically associated with a fully loaded LPG truck/ container heated by a fire (Boiling Liquid Expanding Vapour Explosion - BLEVE) followed by a fire fall. Other explosions can also have a similar effect. This type of explosion can kill all people present in the whole tunnel or in an appreciable length of tunnel and can cause serious structural damage. It may not be possible to mitigate the consequences of such an explosion.

(ii) **Large Explosion**. These are explosions associated with a fully loaded bulk lorry with inflammable gas heated by a fire. This type of explosion may cause serious loss of life but may not result in a significant damage to the structure of the tunnel.

(b) **Release of Toxic Gases/ Volatile Toxic Liquid**. A large release of toxic gases/ volatile toxic liquid from a tanker may cause fatal casualties in the vicinity of the leak or in the zone where the designed ventilation of the tunnel pushes the toxic gases. A part of the tunnel may be protected, however it may not be possible to protect the whole tunnel.

(c) **Fires**. Large/ Small fires inside a tunnel have the potential to cause extensive damage to life and property in a tunnel.

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Classification of Hazardous/ Dangerous Goods

7. There is a need to classify hazardous/ dangerous goods in line with international norms. The most acceptable classification is a system with five groups as under:-

(a) **Group A**. All dangerous goods that are authorised on open roads.

(b) **Group B**. All goods in Group A except those which may lead to a 'Very Large explosion'.

(c) **Group C**. All goods in Group B except those which may lead to a 'Large Explosion' or a large toxic release.

(d) **Group D**. All goods in Group C except those which may lead to a large fire.

(e) **Group E**. Non dangerous goods.

8. **Detailed Classification**. The detailed classification of the above Groups (as also followed by Organisation for Economic Cooperation and Development - OECD) is as per **Appendix B attached**.

9. **Examples of Various Groups**. Based on the above classification, examples of common loads assigned to various groups are illustrated bellow:-

S/No	Group	Examples
(a)	**Grouping A**	LPG in bulk and cylinders, Carbon dioxide in bulk, Ammonia/ chlorine in bulk, Acrolein in bulk and Cylinders, Motor spirit in bulk, Heavy Goods Vehicles without dangerous goods.
(b)	**Grouping B**	Carbon dioxide in bulk, Ammonia/ Chlorine in bulk, Acrolein in bulk and cylinders, Motor spirit in bulk, LPG in cylinders, Heavy Goods Vehicles without dangerous goods.
(c)	**Grouping C**	Motor spirit in bulk, LPG in cylinders, Acrolein in cylinders, Heavy Goods Vehicles without dangerous goods.
(d)	**Grouping D**	LPG in cylinders, Acrolein in cylinders, Heavy Goods Vehicles without dangerous goods.
(e)	**Grouping E**	Heavy Goods Vehicles without dangerous goods.

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International Conventions

10. Various countries like EU, USA, France, Canada, Australia, Spain, Japan, Portugal, Switzerland etc have regulations in place to design tunnels that cater to various types of fire/ explosion/ gas leakage threats of varying intensities. Each of these countries have restrictions on transit of dangerous/ hazardous goods through tunnels. After carrying out an analysis of design/ safety regulations for tunnels and restrictions imposed on passage of dangerous goods prevailing in various countries, it emerged that the most suitable template for Indian conditions should be based on the research carried out by Organisation for Economic Cooperation and Development (OECD) and World Road Association (PIARC).

11. **Quantified Risk assessment Model (QRAM)**. The QRAM model (followed by OECD & PIARC) has been arrived at by taking into account the Occurrence Probability of an event and Damage/ Consequence due to Occurrence of an event. Since it is not possible to consider all possibilities, 13 accident scenarios corresponding to their respective groupings have been considered as follows:-

S/No	Group	Accident Scenarios
(a)	**Grouping E**	Heavy Goods Vehicle fire with no dangerous goods (20 MW) Heavy Goods Vehicle fire with no dangerous goods (100 MW)
(b)	**Grouping D**	**In addition to scenarios for Grouping E:** BLEVE of Liquid Petroleum Gas (LPG) in cylinders Release of acrolein in cylinders.
(c)	**Grouping C**	**In addition to scenarios for Grouping D:** Pool fire of motor spirit in bulk Vapour Cloud Explosion (VCE) of motor spirit in bulk
(d)	**Grouping B**	**In addition to scenarios for Grouping C:** Release of ammonia in bulk Release of chlorine in bulk Release of acrolein in bulk BLEVE of carbon dioxide in bulk (not including toxic effects)
(e)	**Grouping A**	**In addition to scenarios of Grouping B:** BLEVE of Liquid Petroleum Gas (LPG) in bulk Vapour Cloud Explosion (VCE) of LPG in bulk Torch fire of LPG in bulk

Mitigation Techniques

12. **Technical/ Structural Aspects**. The aspects related to technical matters and structural design of tunnels for minimising the adverse effect of fires/ explosives/ gas leaks etc due to accidents during transit of hazardous/ dangerous goods are beyond the scope of this SOP. Chenani - Nasari Tunnel has been designed to handle fires with Heat Release Rate (HRR) of 30 MW and keeping in view the length, traffic and other technical considerations, the Chenani - Nasari Tunnel is a

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Type E Tunnel which does not permit free movement of any hazardous/ dangerous goods. This SOP therefore lays down the procedure/ guidelines for controlled move of hazardous/ dangerous goods through Chenani - Nasari Tunnel.

13. **Effects of Fires**. Details of 33 Major fires in tunnels around the world are available on the internet. The following aspects of these fires need to be considered while planning any mitigation measures:-

(a) Casualties inside a tunnel have a very high proportion of fatalities as compared to ordinary accidents outside a tunnel.

(b) Collisions or vehicle accidents cause less than 50% of fires. Most fires are caused by technical or electrical problems within the vehicle.

(c) There is need to reduce the potential of accidents/ incidents.

(d) All vehicles carrying dangerous goods must be installed with automatic self extinguishing devices.

(e) Clear responsibilities and short response time of safety teams are essential.

(f) Fire Fighting equipment like extinguishers and hydrants must be installed in tunnels and should be clearly visible and easy to use.

(g) Vehicles carrying dangerous goods should always be at a safe distance from other vehicles.

(h) Vehicles with extremely dangerous goods should be accompanied by a Fire Fighting Truck.

14. **Measures to Reduce Probability of Accidents**.

(a) **Technical/ Structural Aspects**. Beyond the scope of SOP.

(b) **Speed Limit**. 40 Kmph for vehicles carrying Hazardous Goods.

(c) **No Overtaking**. Overtaking of vehicles is prohibited.

(d) **Escort Vehicles**. Based on the likely threat, Escort Vehicles with fire fighting and safety equipment should be provided behind/ front/ both front and behind vehicles carrying dangerous goods. All vehicles carrying hazardous goods will have a pilot vehicle and roving safety vehicle will be placed in the tunnel when more than one vehicle carrying hazardous goods is being allowed inside the tunnel.

(e) **Distance Between Vehicles**. Suitable safety distance between vehicles will be ensured. In the case of Bulk Petroleum Lorries (BPL) and vehicles carrying ammunition & explosives, it is legislated that these vehicles be kept two to three Kms apart inside the tunnel, i.e, at any given time not more than five such vehicles will be permitted in the tunnel. Under all circumstances vehicles carrying ammunition and fuzes/ detonators will not be permitted together inside the tunnel.

Contd...P/6.

(f) **Vehicle Checks**. All vehicles carrying dangerous goods be subjected to a comprehensive visual inspection by Tunnel Controlling Authority (Tunnel safety officer to be nominated by NHAI) before entering the tunnel to detect/ identify any over head parts or/ and leakages.

15. **Measures Provided in Chenani - Nasari Tunnel to Mitigate Consequences of an Accident**.

(a) **CCTV**. A CCTV camera network to cover the entire length of tunnel will be installed for purposes as under:-

(i) To monitor traffic flow.

(ii) To detect an incident without loss of time.

(b) Incident Detection and Alarm System.

(c) Fool proof communication system/ PA system/ FM frequency broadcasting will be provided.

(d) Effective access/ exit control measures.

(e) Ambulances will be placed at both portals.

(f) Fire Hydrant and Foam suppression system will be provided.

(g) Fire trucks to be placed inside tunnel when move of hazardous goods is being undertaken.

(h) Fire resistant equipment with resistance of 250 degree Celsius for two hours rating will be catered for.

(j) Coordinated effort with suitably trained fire fighting and medical services of local administration will be ensured.

Actions by Tunnel Controlling Authorities

16. In view of the above analysis there is a need to list out the actions required to be taken by Tunnel Controlling Authorities while permitting passage of hazardous/ dangerous goods through tunnels.

17. **Permissible Groups**. Chenani - Nasari Tunnel is a Type E Tunnel, therefore there will be no free movement of any type of dangerous/ hazardous goods. Movement of such goods will be done in a controlled manner as per this SOP.

18. **Alternative Routes and Parking Places**. In case there is no operational/ military urgency, the alternate route through Patnitop will be adopted for move of hazardous goods. All vehicles awaiting clearance to move through Chenani-Nasari Tunnel will be parked at places designated by NHAI on both sides of the Tunnel to enable proper control over movement of vehicles through the tunnel.

19. **Heat Release Rate (HRR)**. Most Tunnels are designed for HRR of 30 - 50 MW, whereas fire in tankers is in the range of 300 to 500 MW of HRR. Therefore it is not advisable to permit move of tankers containing fuel/ gases etc through tunnels. In case it is unavoidable to do so, then such vehicles must be closely regulated by interrupting normal flow of traffic, or be allowed to transit in extremely low traffic with proper control. Chenani - Nasari Tunnel is structurally designed for 30 MW HRR and hence passage of hazardous goods will be allowed in a controlled manner as specified in this SOP and by ensuring quick action by fixed fire fighting systems of the tunnel and specially placed fire trucks during move of hazardous goods.

20. **Timing/ Traffic Control**. Time windows, depending on the intensity of traffic and available road space, will be formalised as per local conditions by the tunnel authorities. This will preferably be done during night hours when the volume of traffic is low. Any vehicle carrying hazardous goods would be required to inform the Tunnel Safety Officer (nominated by NHAI) at least 48 hrs in advance so that a proper ***hazardous passage manifest*** can be created. Timings would change as per actual traffic conditions. However following timing are recommended:-

(a) **Day Time**. 1300 h - 1500 h.

(b) **Night Time**. 2300 h - 0400 h.

21. **Signages & Marking**. It will be ensured that proper signages are used to indicate Safety Facilities, such as fire extinguishers, emergency telephone and emergency exits etc, that can be used by motorists.

22. **Mitigation Techniques**. Mitigation Techniques as per paragraphs 14 to 17 above will be followed. These are not exhaustive measures and additional action may also be taken as deemed fit for safety and security.

23. **Movement of Army Convoys**. Move of Army Convoys will be permitted as under:-

S/No	Type of Army Convoy	Permission for Transits
(a)	Heavy Goods convoys that transport ordinary petrol derivates or other non military Heavy Goods like Liquefied Petroleum Gas (LPG), Fuels Oils & Lubricants (FOL) etc	As per Para 14 - 22 above.
(b)	Special convoys that transport ammunition, explosives or any type of weapons in quantities that exceed UN defined "small quantities"	Special escort convoy be used with absolute traffic disruption.
(c)	Emergency situations	Absolute priority for Army for operational reasons - urgent and priority passage.

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24. **Mixing of Groups, Quantity Restrictions and Types of Vehicles.**

(a) As far as practicable, explosive belonging to different compatibility groups shall normally be transported in separate vehicles.

(b) Under special circumstances like, where a full load cannot be made from one group, explosives of groups C, D and E may be mixed and transported together up to maximum quantity of 500 kg NEC.

(c) Compatibility group 'S' can be mixed with any other group except A&L.

(d) Fuzed ammunition shall invariably be transported separately.

(e) Gross weight of the load in no case should exceed the authorized load to be carried in a vehicle; the net explosives content in no case shall exceed 6000 kg.

(f) Fuzes and corresponding ammunition be carried in separate vehicles.

(g) Detonators and explosives will be carried in separate vehicles.

25. **Safety Precautions : Vehicles Carrying Ammunition and Explosives.**

(a) No smoking will be permitted in the tunnel within 30 m of the vehicle or stack containing explosives and no fire or naked light will be allowed within 90 m of the vehicle or stack.

(b) No fuel will be carried in a vehicle loaded with explosives except in the fuel tank.

(c) No intoxicated person will be allowed to be in or in attendance on the vehicle at any time during loading, unloading and conveyance.

(d) The speed of the vehicle should NOT exceed 40 km per hour.

(e) A vehicle loaded with explosives will under NO circumstances be left unattended.

(f) Inside the Tunnel, distance between vehicles will be maintained as per para 14 (e) above. Outside the Tunnel, when explosives are carried in a convoy, the distance between any two vehicles will not be less than 100 metres but in case of fire on any vehicle the distance will be increased to at least 300 metres.

(g) When WP (White Phosphorus) ammunition is transported, adequate quantities of sand and water will also be carried in suitable containers. 4% copper sulphate solution and soft soap in a wide mouth jar will also be carried.

(h) In an event of an organized halt of convoy necessary safety distance as per para 25 (f) above will be maintained and in no eventuality will the vehicles be left unescorted.

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(j) No cooking, smoking or lighting of any fire will be permitted in the vehicles or within the vicinity of the vehicle.

(k) Torches/ hand held search lights will be made available to the escort.

(l) Maximum number of vehicles in a single convoy will not exceed 24. One vehicle will be designated as a dummy vehicle. Dummy vehicles will carry the baggage of the escort party and would also be capable of carrying ammunition load in case of any breakdown of an ammunition carrying vehicle.

(m) An MRT (Mobile Repair Team) will accompany the convoy to carryout repairs required in-situ. In case in-situ repairs are not possible then vehicle will be towed to the nearest garrison for repair and the ammunition loaded in the dummy vehicle.

(n) Ammunition/ Explosive carriage will be in adherence to laid down Army norms (certificate to be issued by Army Authorities) and at no given time more than 500 kg of Net explosive content will be allowed to pass through the tunnel. At no time will ammunition/explosive vehicles and vehicles carrying detonators/fuses be inside tunnel at the same time. Such vehicles will be passed through the tunnel after restricting all other traffic. Any such vehicle will be accompanied with a pilot vehicle. During the move of such convoys, fire fighting trucks will be placed inside the tunnel as back up to the intrinsic fire hydrant system of the tunnel.

Responsibilities for Transporters and Drivers

26. **Responsibilities of Transporters**. The responsibilities of transporters and drivers are as follows:-

(a) To classify the hazardous materials and marking/ label on transporting vehicle/tanker.

(b) To follow guidelines on packaging and to mark them accordingly.

(c) To follow appropriate procedure for blocking and bracing hazardous materials.

(d) To declare the origin and destination points and fix a designated route.

(e) To provide training to the drivers and helpers of transporting vehicles so that they are skilful in handling emergency situations.

(f) To check all fittings and equipment to prevent any leakage and spillage.

(g) To ensure that the transporting vehicle is fitted with Mechanical /Digital Tachograph.

(h) To obtain prior permission of Tunnel Authority for move of dangerous/ hazardous goods. The system should be automated for online permissions.

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27. **Responsibilities for Drivers**. The responsibilities of drivers are as follows:-

(a) To keep all travel documents including their personal documents like license, training certificates etc.

(b) To keep adequate communication devices (cell phone etc,) with them to cater for emergency situations.

(c) To be alert while driving and be vigilant for instructions by authorities.

(d) To check the transporting vehicle for any fault in mechanical or electrical fittings and ensure that fire extinguishing devices and other necessary tools and equipment are kept functional.

(e) To remove ignition key when the vehicle is not running or is parked.

(f) To follow the instructions of Tunnel Authority on speed limits and maintain longitudinal and lateral distances between vehicles etc.

(g) To avoid smoking and carrying igniting devices.

(h) To avoid consuming substances that reduce driving vigilance including prescription or non-prescription drugs that prohibit operation of heavy equipment, alcohol, caffeine-based beverages or illicit drugs etc.

28. **Check List**. A detailed check list for various actions to be taken is attached as Appendix 'C'.

Conclusion

29. Since the passage of dangerous/ hazardous goods Chenani - Nasari Tunnel cannot be avoided, this SOP is meant to formalise the method of permitting transit of these goods through Chenani - Nasari Tunnel. An attempt has been made to follow best international practices with flexibility to adapt to local conditions/ operational requirements as applicable. The measures suggested in the SOP are by no means exhaustive and additional measures/ mitigation techniques may be adopted by concerned authorities to ensure safety and security of lives, goods, vehicles and the structural integrity of the Chenani - Nasari Tunnel.

30. A periodic review of the SOP will be undertaken to incorporate practical experiences of stakeholders in the field and any new methodology/ international trends that may emerge.

Appendix - A
(Refers to Para 2 (d) of paper)

Design Characteristics of Chenani - Nasari Tunnel.

(a)	Length	-	8.983 Km (Bi-Directional).
(b)	Escape Tunnel Length	-	8.983 Km (Parallel to main Tunnel).
(c)	Carriageway width	-	Main Tunnel - 9.35m Escape tunnel - 5.5m
(d)	Tunnel followed by bridge	-	50m in North Portal. 40m in South Portal.
(e)	Approaches	-	1340m on South. 563m on North.
(f)	Toll Plaza	-	1 No - Split at two location. (on South & North portals).
(g)	Vertical Clearance	-	5.5m
(h)	Rotaries	-	2 Nos. (at km 89 & at km 130).
(j)	Bypassed section	-	41 km.
(k)	Truck Lay Byes	-	9 No.
(l)	Traffic	-	12,000 - 15,000 PCU
(m)	Design Heat Resistant Rate (HRR)	-	30 MW*

Appendix-B (Refers to Para 8 of paper)

Class	Grouping A	Grouping B	Grouping C	Grouping D	Grouping E
	All dangerous goods permitted to be transported by ADR.	All dangerous goods expect those with very large explosion hazard.	All dangerous goods expect those with very large explosion, large release of toxic gas or liquid or risk of clod BLEVE hazard.	All dangerous goods except those with very large explosion, large release of toxic gas or liquid or risk of cold BLEVE and large fire hazard.	No dangerous goods above ADR 10 011therehold.
1	All	Below ADR 10 011 threshold only.	Below ADR 10 011 threshold only.	Below ADR 10 011 threshold only.	Below ADR 10 011 threshold only.
2	All	A, O, T, TC, TO, TOC gases in tanks and cylinders. F, FC, TFC gases in cylinder only.	A, O and F gases in cylinders only.	A, O, F gases in Cylinders only.	Below ADR 10 011 threshold only.
3	All	All expect 6°, 7°.	All expect 6°, 7° and 1° 5°,31°-34° in tanks/ tank containers.	All expect 6°, 7° and substances in tanks/ tank containers.	Below ADR 10 011 threshold only.
4.1	All	All expect 21° - 25°, 31°, 32°, 41°, 42°.	All expect 21° - 25°, 31°, 32°, 41°, 42°.	All PG II and III substances except 21°-25°, 31°-50°.	Below ADR 10 011 threshold only.
4.2	All	All PG II and III substances in tanks/ tank containers. All substances in packages.	All PG II and III substances in tanks/ tank containers. All substances in packages.	All PG II and III substances in tanks/ tank containers. All substances in packages.	Below ADR 10 011 threshold only.
4.3	All	All PG II and III substances in tanks/ tank containers. All substances in packages.	All PG II and III substances in tanks/ tank containers. All substances in packages.	All PG II and III substances in tanks/ tank containers. All substances in packages.	Below ADR 10 011 threshold only.
5.1	All	All PG II and III substances in tanks/ tank containers. All substances in packages.	All PG II and III substances in tanks/ tank containers. All substances in packages.	All PG II and III substances in tanks/ tank containers. All substances in packages.	Below ADR 10 011 threshold only.
5.2	All	All except 1°, 2°, 11° and 12°.	All except 1°, 2°, 11° and 12°.	Below ADR 10 011 threshold only.	Below ADR 10 011 threshold only.
6.1	All	ADR items 11° - 28° 31° - 36°, 41° - 44°, 51° 68°, 71°- 73°, and 90° in tanks/ tank containers and packaging.	All ADR items in Grouping B in packing, PG II and III in tanks/ tank containers.	All ADR items in Grouping B in packing, PG II and III in tanks/ tank containers.	Below ADR 10 011 threshold only.
6.2	All	Items 3°, 4°.	Items 3°, 4°.	Items 2°, 3°, 4°.	Below ADR 10 011 threshold only.
7	All All dangerous goods permitted to be transported by ADR.	All All dangerous goods except those with large explosion hazard.	All except UN Nos. 2977 and 2978. All dangerous goods except those with large explosion, large release of toxic gas or liquid or risk of cold BLEVE hazard.	All except UN Nos. 2977 and 2978. All dangerous goods except those with large explosion, large release of toxic gas or liquid or risk of cold BLEVE and large fire hazard.	Below ADR 10 011 threshold only. No Dangerous Goods above ADR 10 011 threshold.
8	All	All	PG II and III substances in tanks/ tank containers. All substances in packages.	PG II and III substances in tanks/ tank containers. All substances in packages.	Below ADR 10 011 threshold only.
9	All	All	All	All except item 4 in tanks/ tank containers.	Below ADR 10 011 threshold only.

Key : PG = Packing Group; A = Asphyxiant; C = Corrosive; F = Flammable; O = Oxidising; T = Toxic.
Note : Empty unlearned tanks/ tank containers and packaging shall be treated as if full or part-full.

Appendix - C
(Refers to Para ... of paper)

CHECKLIST FOR FOR PASSAGE OF VEHICLES CARRYING HAZARDOUS MATERIAL THROUGH CHENANI - NASARI TUNNEL

SER	PARAMETERS	CHECKLIST		REMARKS
ategorisation of Hazardous/ Dangerous Goods.				
1	Group A	YES	No	
2	Group B	YES	No	
3	Group C	YES	No	
4	Group D	YES	No	
5	Group E	YES	No	
easures to Reduce Probability of Accidents.				
6	Speed Limit Briefing to Dvr (Under 40 kmph)	YES	No	
7	Driver awareness about **No Overtaking**	YES	No	
8	Escort vehicle with fire fighting arrangements	YES	No	
9	Briefing on maintaining safety distance of 2 to 3 Kms between the vehicles inside the Tunnel.	YES	No	
10	Comprehensive visual inspection of vehicles by Tunnel Controlling Authority	YES	No	
easures Provided Inside the Tunnel.				
11	C CTV Functional	YES	No	
12	PA System	YES	No	
13	Broadcasting System			
14	Incident Detection System & Alarm System	YES	No	
15	Fool proof communication system			
	Effective access/ exit control measures.			
16	Presence Of Ambulance at both Portals	YES	No	
17	Presence of Fire Hydrant and Foam suppression system	YES	No	
18	Presence of Fire trucks inside tunnel while moving hazardous good	YES	No	
19	Presence of Fire resistant equipment having resistance of 250 degree Celsius.	YES	No	
20	Presence of trained fire fighting and medical team at both Portals.	YES	No	
ovement of Army Convoys : Certificate by Army Authorities				
22	Certificate issued by Army that move of special convoys to transport ammunition, explosives or any type of weapons etc is carried out as per laid down military norms.	YES	No	
23	If the move of convoys is in **Emergency Situation** - Certificate required by Army Authorities.	YES	No	
24	For explosive belonging to different compatibility groups being transported in separate vehicles.	YES	No	
25	For explosive groups C, D and E being mixed & transported together up to maximum quantity of 500 kg NEC.	YES	No	
26	For Group 'S' explosives is being mixed other groups except Group A & L.	YES	No	

27	For fuzed ammunition is being transported separately.	YES	No	
28	For gross weight of the explosives being carried to be less than 6000 kg.	YES	No	
29	For detonators and explosives being carried in separate vehicles.	YES	No	
Safety Precautions : Vehicles Carrying Ammunition and Explosives.				
30	Physical check that **No smoking** is permitted within 30 m of the vehicle or stack containing explosives.	YES	No	
31	Physical check that **No fuel** is being carried in a vehicle loaded with explosives except in the fuel tank.	YES	No	
32	Physical verification that **No intoxicated person** is allowed to be in or in attendance on the vehicle at any time during loading, unloading and conveyance.	YES	No	
33	Physical verification that vehicle loaded with explosives under **No circumstances** is left unattended.	YES	No	
34	Briefing of the Driver that No cooking, smoking or lighting of any fire will be permitted in the vehicles or within the vicinity of the vehicle carrying explosives.	YES	No	
35	Physical check that Torches/ hand held search lights are available in the escort.	YES	No	
Responsibility of Transporter.				
36	Physical check for label regarding classification of hazardous materials on vehicle.	YES	No	
37	Check for adherence of guidelines for packaging and marking of hazardous goods.	YES	No	
38	Certificate for procedure to be followed for blocking and bracing hazardous materials.	YES	No	
39	Certificate bearing origin and destination points for transportation of hazardous goods.	YES	No	
40	Certificate for training of drivers and helpers	YES	No	
41	Physical check of all fittings and equipment against leakage & spillage.	YES	No	
42	Check that vehicle is fitted with mechanical /digital Tachograph.	YES	No	
43	Verification of permission obtained from Tunnel controlling Authorities for move of hazardous goods.	YES	No	
Responsibility of Drivers				
44	Inspect complete travel documents like license, training certificates etc.	YES	No	
45	Check for working communication device with driver to cater for emergency situations.	YES	No	
46	Physical check that driver is alert and vigilant to receive instructions by authorities.	YES	No	
47	Physical check of transporting vehicle for any fault in mechanical or electrical fittings and ensure that fire extinguishing devices and other necessary tools and equipment are kept functional.	YES	No	
48	Physical check that the ignition key is removed when the vehicle is not running or is parked.	YES	No	

49	Awareness of driver towards the instructions of Tunnel Authority on speed limits and maintaining longitudinal and lateral distances between vehicles etc.	YES	No	
50	Physical check that no smoking & igniting devices are being carried with the driver carrying hazardous goods.	YES	No	
51	Verification that driver has not consumed any substances that reduce driving vigilance including prescription or non-prescription drugs which prohibit operation of heavy equipment like alcohol or caffeine-based beverages or illicit drugs etc.	YES	No	
Actions by Tunnel Controlling Authorities				
52	Movement of permissible hazardous goods in a controlled & regulated manner	YES	No	
53	Presence of signage to indicate Safety Facilities like fire extinguishers, emergency telephone & emergency exits	YES	No	
54	**Timings of Move.**			
	Day – 1300 – 1500 Hrs	YES	No	
	Night – 2300 – 0400 Hrs	YES	No	