

To,
 Owners, Agents and Managers of all Mines

Subject: Provision of proper Audio Visual Alarm during reversing of vehicles.

Occurrence of accidents due to dumpers, tippers, trucks and other surface transportation machineries during reversing, still remains a matter of concern. In the past, attention was drawn vide DGMS(Tech) Circular No. 7 of 1977 and Circular No. 12 of 1999 but it has been revealed during inspections that in many dumpers and tippers, still audio visual alarms (to be actuated automatically while reversing) have not been provided and wherever provided, most of them were found nonfunctional. It is also learnt that audio visual alarm sets can not cope up with the vibration, dusty condition and rain water/other water sources used for cleaning.

It is, therefore, recommended that no dumper and tipper, henceforth, shall be allowed to be in used without providing reliable type of audio visual alarms to be actuated automatically during reversing. The following specification of such audio visual alarm is recommended.

(1) Such audio visual alarm (A.V.A.) shall conform to IS 13947 (Part I) of 1993 for the following protection against dust and water.

<u>Degree of protection</u>	<u>Test conditions as per IS 13947 (Part 1) – See Sub Clause</u>
1. Protected against dust and shall prevent ingress of dust-	C 7.5 & C 7.6
2. Protected against dripping water-----	C 8.1
3. Protected against spraying water-----	C 8.3
4. Protected against splashing water-----	C 8.4

(2) Such audio visual alarm shall also conform to IS 13109 (Part I) of 1991 for the following environmental requirements :-

<u>Test</u>	<u>Test conditions</u>
1. Vibration Test-) As per Table ! of IS 13109 (Part1) of 1991
2. Shock Test-)
3. Bump Test-)
4. Drop and Topple Test-)
5. Cold Test-)

(3) The above tests (as per BIS 13947 & 13109) carried out as per SAE J 994 may also be accepted. In addition, the following Endurance Test of A.V.A. may be carried out as a type test in accordance with SAE J 994.

The details of SAE J 994 is given below :-

(Title- Alarm-Back up – Electric Laboratory- Performance testing,
Publication date - 08-01-1993,
Publisher- Society of Automatic Engineers, U.S.A.)

- | Test | Test Conditions |
|--|-----------------|
| a) Endurance Test at High Temperature.) | As per Para 7.1 |
| b) Endurance Test at Room Temperature.) | and Para 7.2 |
- (4) Sound levels to be checked before and after the above tests. Sound level to be checked as described in SAE J 994 Standard. Sound level after the test shall be within +_ 5 dBA of the value for which the equipment is designed.
- (5) Allowable Sound Level :
- The sound of the Audio-visual alarm should be more than the surrounding noise level so that it can be heard distinctly. Since the reversing process takes normally 2 to 3 minutes, 110 dB sound level is recommended for Audio-visual alarm. Self adjusting back up alarm may be preferred where the sound level is automatically maintained at 5 dB higher level than the surrounding noise level.
- (6) protection against splashing of mud and water on the pressure switch shall be provided by the HEMM manufacturer/user industry.
- (7) Mechanical Lock may be provided to prevent unauthorized tampering of the alarm.
- (8) Test facilities for the above tests are available in C.M.R.I., Dhanbad and in other B.I.S. approved test houses. Fresh test report for every major lot should be insisted.

You are requested to comply to these recommendations in the interest of safety

Sd/-
(R. Sharma)
Director General of Mines Safety,
Dhanbad