

**Amendment Slip No.-07 dated-13.07.2020 to the Accident
Manual 2012 of NCR**

[Ref: Director (Safety)-IV, Railway Board letter no.-2018/Safety(A&R)/1/8 dated- 25.01.2019].

1. Existing Appendix-P (i), (ii) & (iii) is deleted and substituted as under -

APPENDIX-P (i)

**Observation/ Measurement Proforma for Accident Investigation/
Inquiry**

General Guidelines

1. Careful observation of clues and a comprehensive record thereof is vital for accident enquiry. In addition, a comprehensive record of track and rolling stock parameters and operating features is required for investigation of derailments.
2. There are two broad categories of derailment
Sudden derailment caused by wheel set jumping of the rails. Such a derailment indicates that the derailing forces were high enough to suddenly force the wheel off the rail. These are typically caused by failure of vehicle/track components, obstruction on track, entanglement of hanging parts of rolling stock etc. These derailments are characterized by a short mark on rail table between Point of Mount and Point of Drop. In some cases the Point of Mount may even be absent.
Derailment by flange climbing, caused by wheel mounting the rail in a relatively gradual manner. It indicates that the derailing forces were powerful enough to overcome the normal stabilizing forces, yet not sufficient to cause a sudden derailment. Such derailments are characterized by a longer mark on the rail table between Point of Mount and Point of Drop. Track and rolling stock parameters and operating features influence the rail-wheel interaction forces and, hence, their complete record and a comprehensive analysis is required to arrive at the mechanism of derailment. Cause and consequence of derailment are required to be differentiated through this comprehensive analysis.
3. Locating and examining the wheel mounting mark(s) at the initial point of derailment is very important for identifying the category of derailment. Precise measurements and critical and detailed examination of the wheel mounting marks should be made e.g. their length, strong or faint, broken or continuous, single or multiple, etc. Photographs should be taken of such marks; not only on the rail but also on the fastenings, sleepers and ballast.
4. Derailment proneness increases with increased Lateral wheel force, reduced Vertical wheel load (Off loading) and increased Positive Angularity of wheel. Derailment proneness becomes substantially higher in case of axle moving with a persistently positive angularity. Track and rolling stock parameters and operating features should be critically analyzed for their contribution towards these causes. In case of derailments in curve, proper functioning of Bogie rotation system to ensure undue angularity needs close examination. Contribution of track

twist and spring defects and twist in bogie frame/vehicle under-frame to derailments caused by wheel Off loading needs to be analyzed. In case of derailment at high speed, parameters affecting vehicles oscillation and dumping thereof needs a close analysis.

5. While analyzing the mechanism of derailment, relative contribution of track and rolling stock parameters to the rail-wheel interaction forces needs a comprehensive analysis. Reference should be made to the safety limits/Maintenance limits specified in IRPWM/IRCA Rules/Maintenance Manuals.
6. Proforma for measurement of locomotive, Wagon and Carriage are attached as Annexure -A, B & C respectively for recording the details. The Joint Measurement to be submitted by Senior Supervisors shall not be complete till all the measurement of rolling stock and track as per enclosed proforma have been recorded. Only completed joint measurement w.r.t. rolling stock and track shall become a document to be relied upon by the enquiry committee for drawing conclusion regarding cause of accident.
7. No enquiry shall be completed before the complete measurement of rolling stock and track is available and made part of the enquiry report. Enquiry committee may get additional measurements done as per requirement of the derailment case.
8. The photographs of the concerned sections of track and part of rolling stocks shall be taken and annexed in the enquiry report. ART personnel should be trained for identifying such relevant part of tracks and rolling stocks involved in the accident.
9. In case of derailment of passenger trains causing injury to passengers, video recording of the concerned part of track and rolling stock shall be carried out by nominated ART personnel, trained for the purpose.

Photography and videography of accident site shall be with great care & precision, similar to a crime scene photography/videography. ART personnel nominated for this shall be suitably trained for the purpose. The photographs, videos should be self explanatory such that relevant conclusion can be drawn.
10. Site sketch of the derailment/accident location shall be prepared giving due care that all the relevant items are included along with the dimensions. A sample sketch is attached for guidance. Instructions for the preparation of sketch of the site of accident has been given in "Accident Manual" shall be followed. Preservation of relevant clause, documents & photographs/videography of the accident scene shall be done under the supervision of Safety Officials of the Division.
11. M&C report from RDSO must also be part of accident enquiry report in case accident is attributed to breakage of any component of track or rolling stock.
12. In case of a suspected sabotage, Tell-tale sign must be preserved and recorded.

