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Item 5 (a) of the provisional agenda

Proposals for amendments to RID/ADR/ADN: pending issues

Possibility of electronic processes in the examination of safety advisers, ADR vehicle drivers and ADN experts

Transmitted by the Government of Germany^{1,2}

Introduction

¹ In accordance with the programme of work of the Inland Transport Committee for 2014–2015 (ECE/TRANS/240, para. 100, ECE/TRANS/2014/23, cluster 9, para.9.2).

² Circulated by the Intergovernmental Organisation for International Carriage by Rail (OTIF) under the symbol OTIF/RID/RC/2015/21.

Summary

Executive summary: The current provisions of RID/ADR/ADN 1.8.3 and ADR/ADN 8.2.2 stipulate that the examinations must be "in writing". At the Joint Meeting in September 2014, most delegations supported the use of electronic examination processes. In so doing, it must be ensured that exam participants are supervised and authenticated, electronic devices cannot be tampered with and that the examination process and results are documented.

Action to be taken: Amendment of/additions to the provisions concerning the examination of safety advisers in RID/ADR/ADN 1.8.3

Note to the Working Party on the Transport of Dangerous Goods (WP.15) and the ADN Safety Committee to make equivalent amendments to ADR/ADN 8.2.2 for the examination of vehicle drivers and experts.

Introduction

1. In September 2014, the Joint Meeting dealt with informal document INF.13 from Germany, which contained proposals for carrying out electronic examination processes for safety advisers, ADR vehicle drivers and ADN experts. After a discussion, the following was recorded in paragraph 36 of the report:

"Most delegations supported the use of electronic means for examinations for safety advisers in principle but made some comments on the proposed texts. As the document was an informal one, they were invited to submit their comments to the representative of Germany, who would submit a formal proposal at the next session."

2. After the last Joint Meeting, Germany did not receive any further comments. However, the main elements of the comments made at the last meeting have been incorporated into this revised proposal.

3. The aim of the following proposal is to make clear that electronic examination processes (i.e. the use of electronic devices for entering and, where appropriate, marking answers) are deemed to be written examinations. It should be made clear that these examinations must be supervised in the same way as examinations done in writing and what additional conditions apply to the carrying out of electronic examinations.

4. As before, the competent authorities or the examining bodies are responsible for the correct execution of electronic examinations.

Proposals for amendment

5. RID/ADR/ADN 1.8.3.10 could be supplemented as follows (new text is underlined):

"1.8.3.10 The examination shall be organized by the competent authority or by an examining body designated by the competent authority. The examining body shall not be a training provider.

The examining body shall be designated in writing. This approval may be of limited duration and shall be based on the following criteria:

- competence of the examining body;
 - specifications of the form of the examinations the examining body is proposing, including the infrastructure and organisation of electronic examinations in accordance with 1.8.3.12.5;
 - measures intended to ensure that examinations are impartial;
 - independence of the body from all natural or legal persons employing safety advisers."
6. The following new 1.8.3.12.5 could be inserted in RID/ADR/ADN:
- "1.8.3.12.5** Written examinations may be performed, in whole or in part, as electronic examinations, where the answers are recorded and evaluated using electronic data processing (EDP) processes, provided the following conditions are met:
- (a) The competent authority or an examining body designated by the competent authority shall supervise every examination.
 - (b) The hardware and software shall be checked and approved by the competent authority. The functioning of the application and the technical components shall be subjected to regular quality controls. The possibility of any manipulation and deception shall be ruled out. Proper technical functioning shall be ensured. Arrangements as to whether and how the examination can be continued shall be made for a failure of the devices and applications. No aids shall be available on the input devices. The devices shall not be able to communicate with each other.
 - (c) All candidates taking the examination shall use the same input devices and applications. It shall be ensured that the candidates are instructed in the use of the devices and the application prior to the examination.
 - (d) Authentication of the candidate on the device used and the unambiguous and permanent assignment of exercises and answers shall be ensured.
 - (e) Inputs and actions of each candidate shall be logged. The determination of the results shall be transparent. All examination documents shall be documented and kept as a print-out or electronically as a file."

Justification/additional information

7. The aim of the above criteria is to prevent attempts to manipulate the examinations and cheat. In addition, it must be ensured that the examination process is not disrupted.
8. Electronic examinations must also be held in a central examination room allocated by the authority or examining body and must be held under the same conditions as a traditional written examination in which candidates fill out questionnaires by hand. Only the paper examination sheet should be replaced by an electronic device. It must not be possible to hand in examination questions from decentralised places, such as a place of work or from home, e.g. via an internet connection.
9. Candidates could be authenticated on the input device by being allocated a unique code/PIN or by means of an identification document with electronic proof of identity.

10. For multiple choice questions, the marking of answers as correct or wrong can be automated and should be checked by an examiner.
11. The quality control of the hardware and software used must cover the following areas. Quality control is the responsibility of the competent authority that approves and perhaps uses the software itself, or by the examining body designated by the competent authority.

Technology

(a) Equipment

- Monitor with a resolution of a least 1024x768 pixel,
- Keyboard with no technical defects,
- Mouse with no technical defects,
- Standard PC with supported operating system and browser,
- Stable (interruption-free) connection between client and server.

(b) Rules for use

In order to avoid subsequent appeals, it is particularly important that candidates endorse an available set of rules for use. In addition to the usual instructions, the rules should also contain the following items:

- Confirmation of sufficient operating ability,
- Confirmation that the technical system will not be tampered with,
- Confirmation that supervisors will be informed immediately of any obvious disruptions.

(c) What to do in the event of disruptions

Supervisors shall be provided with information on what to do in the event of malfunction scenarios which are known in advance or which are conceivable. Significant disruptions are:

- Breakdown of testing station components (mouse, keyboard, monitor)
- Reaction: Change station and continue the examination (it is not advisable to exchange components during an ongoing session)
- Computer breakdown
- Reaction: Change station and continue the examination
- Interruption of connection between station and server
- Reaction: Change station and continue the examination
- Interruption of connection between all stations and server
- Reaction: Interrupt/terminate the examinations and continue later (offer a new date if necessary).

In order to provide suitable assistance in the event of disruptions, suitably trained supervising personnel should be present in the examination room at all times.

In order to avoid bottlenecks if individual examination stations malfunction, a sufficient number of reserve computers should be ready to use. A supply of around

1:10 to 1:20 should be sufficient (e.g. in a room with 15 stations, one reserve computer should be available).

Authentication of candidates/attribution of the examination

Examination performance levels

- Examinations shall be purposely released,
- Unique authentication (LOGIN/PIN),
- Session starts only after confirmation,
- If necessary, individual document based setting of the examination,
- Optional: random sequence of exercises,
- Optional: random sequence of multiple choice answers,
- All input must be saved on the server immediately,
- No data must be saved on the examination station's storage devices,
- Disable/enable function,
- Repeat function,
- If necessary, automatic generation of error logs.

Evaluation levels

- Read-only hard copy with full exercise description, candidate's input and points awarded by system,
- Overview of the exercises actually selected, with marks/exercise achieved,
- Individual post-evaluation option by authorised persons,
- Complete lockfiles to determine the date and place of examinations,
- Possibility for candidates to see examination subsequently,
- Version-compliant data archiving.

The prevention of attempts to manipulate/cheat can be ensured by the following means:

- Use of live boot data storage devices:

In order to counter attempts at cheating, a so-called secure browser can be used. This prevents the execution of system commands and other programmes during the examination. The system does not require any installation and can, if necessary, be started via the live booting of a removable storage device (e.g. USB stick or CD ROM).

- Additional security by using screenshots:

In order to enable further recording tolerant of errors made by users, it is possible to produce a video file by means of screenshots of individual images of the examination. These screenshots offer the possibility of verifying the results of the examination in law at a later stage.

The following options exist for the documentation and storage of examinations and results:

Confirmation before archiving of the "exercises handed in"

- (a) With a change of media

At the end of the examination, the answers are printed out and signed. This means that even though the examination was carried out on a computer, written documents can be archived. Their authenticity is ensured by candidates' signatures. The electronic data are then deleted.

- (b) Without change of media

The authenticity of the data is ensured by means of an electronic signature.

12. The provisions of ADR 8.2.2 concerning the examination to conclude the driver's training, and of ADN 8.2.2 concerning the examination to conclude the expert's training also prescribe a written examination. WP.15 and the ADN Safety Committee could check whether the possibility of electronic examinations could also be introduced here. Germany would be prepared to submit a corresponding proposal to WP.15 and the ADN Safety Committee.
