AECD/AECS self-test and status indication

9th AECS meeting

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Self-test and status indication

Outline of the proposed procedure

- **Purpose**
  - Verify that a warning will be given to the occupants of the vehicle in the event of a critical system failure which would result in an inability to execute an emergency call.
  - Create consistent expectations of the items to be covered by the self-test across type-approval authorities.

- **Proposed procedure**
  - Procedure based on documentation and selected physical verification test (analogous to UN R13-H and UN R79).
  - Compromise for type-approval testing between having to test each failure and relying on documentation only.

- **Key features**
  - Narrows self-test requirements down to detectable system failures only.
  - The self-test function shall cover a set list of items where technically feasible with the chosen system design and architecture.
  - Visual tell-tale/warning light: Activated while failure is present; may be cancelled temporarily by the driver, but shall be repeated on ignition-on.
  - Other potential failure cases, which cannot be detected by a system self-test, should be covered during PTI.
## Self-test and status indication

### Procedure: Information regarding self-test

- **Template of information – example rows**

<table>
<thead>
<tr>
<th>Item</th>
<th>Monitored by self-test?</th>
<th>If yes: Technical principle applied for monitoring</th>
<th>If no: Technical reasons prohibitive of monitoring</th>
<th>Malfunction simulation feasible?</th>
<th>If no: technical reasons prohibitive of simulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>AECD/AECS ECU is in working order</td>
<td>yes/no</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>External mobile network antenna is connected</td>
<td>yes/no</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mobile network communication device is in working order (no internal hardware failure, responsive)</td>
<td>yes/no</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>External GNSS antenna is connected</td>
<td>yes/no</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>...</td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
Self-test and status indication

Procedure: Information regarding self-test

- “Where technically feasible with the chosen system design and architecture”, the self-test function shall monitor at least the following technical items:
  - **AECD/AECS ECU** is in working order (e.g. no internal hardware failure, processor/memory is ready, firmware is loaded successfully, logic function in expected default state)
  - External **mobile network antenna** is connected
  - **Mobile network communication device** is in working order (no internal hardware failure, responsive)
  - External **GNSS antenna** is connected
  - **GNSS receiver** is in working order (no internal hardware failure, output within expected range)
  - **Crash control unit** is in working order (e.g. no internal hardware failure, processor is ready, logic function in expected default state)
  - No **communication failures** (bus connection failures) of relevant components
  - **SIM** is present
  - **Dedicated battery** is connected
  - State of health of dedicated battery
  - **Microphone(s)** are connected
  - **Loudspeaker(s)** are connected
  - **Manual call button** is connected
  - **Status indicator** is connected

Items can be omitted based on technical reasons, why it is not feasible to monitor the item with the chosen design/architecture (to the satisfaction of the type-approval authority)

This means, emphasis is given to pragmatic self-testing: This should be possible without having to significantly change the system design or architecture, which is governed by the vehicle’s communication and information sharing protocols.
Self-test and status indication

Test procedure: Self-test verification

- Simulate a malfunction of the AECD/AECS by introducing a critical failure in one or more of the items monitored by the self-test function.
  - According to the technical documentation provided by the manufacturer.
  - The item(s) shall be selected at the discretion of the technical service.

- Switch the ignition ‘on’ and verify that the malfunction indicator illuminates shortly afterwards.

- Switch the ignition ‘off’ and restore the AECD/AECS to normal operation.

- Switch the ignition ‘on’ and verify that the malfunction indicator does not illuminate or extinguishes shortly after illuminating initially.
Thank you

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