Confusion caused by similar call signs was the most frequently reported contributing factor in air-ground voice communication incidents in European airspace, according to a study of data from a survey of airlines and air navigation service providers. In 535 reported incidents during communication between pilots and air traffic controllers from Oct. 25, 2004, to March 31, 2005, “similar call sign” was a contributing factor in 33 percent. The next most frequent contributing factor, “frequency change,” was found in 12 percent.

The study, undertaken by National Aerospace Laboratory (NLR)—Netherlands for Eurocontrol, analyzed incidents classified as loss of communication; readback/hearback error; communication equipment problem; no pilot readback; or hearback error. Another category — the largest — included incidents that did not fit into any of those and were classified as “other communication problem.” In some incidents, the type of problem was not reported. The number of incidents and percentages by category are shown in Table 1. In every category, “similar call sign” was at the top of the list of contributing factors.

Numerous other factors contributed to the 535 incidents, but most played a role in less than 5 percent of incidents (Figure 1).

The study found that 36 percent of all incidents had no safety consequence (Figure 2, page 52). About one-fourth involved a “prolonged loss of communication.” Other
consequences included “altitude deviation,” “loss of separation” and “wrong aircraft accepted clearance.”

The term “loss of communication” refers to situations in which the flight crew has no radio contact with air traffic control (ATC) for “some time for some reason,” the report says. Most of these incidents (73 percent) occurred in the cruise phase of flight; 9 percent and 4 percent occurred during the approach phase and landing phase, respectively.

In “loss of communication” incidents, the three most common contributing factors were “frequency change” (35 percent), “sleeping VHF receivers” (15 percent) and “radio equipment malfunction — air” (12 percent).

The most frequent consequence, found in 81 percent of the “loss of communication” incidents, was “prolonged loss of communication.”

The report says, “An incorrect readback was reported in 15 of the 52 ‘readback/hearback error’ occurrences, while in 11 of those 15 cases, the incorrect readback was not detected by the controller.” Contributing factors in the category included “similar call sign” (37 percent), “pilot expectation” (17 percent) and “frequency change” (15 percent). Consequences of a readback/hearback error included “altitude deviation” (in 37 percent), “wrong aircraft accepted clearance” (31 percent) and “heading/track deviation” (8 percent). There were no safety consequences in 13 percent.

Communication equipment problems were involved in 44 of the 535 incidents. The most frequent problems in this category were “radio equipment malfunction — air” (52 percent), “radio equipment malfunction — ground” (36 percent) and “radio interference” (11 percent). In 34 percent of the incidents there were no

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### Contributing Factors

<table>
<thead>
<tr>
<th>Factor</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Similar call sign</td>
<td>33.0%</td>
</tr>
<tr>
<td>Frequency change</td>
<td>12.0%</td>
</tr>
<tr>
<td>Radio equipment malfunction — air</td>
<td>8.0%</td>
</tr>
<tr>
<td>Radio interference</td>
<td>8.0%</td>
</tr>
<tr>
<td>Content of message inaccurate/incomplete</td>
<td>5.0%</td>
</tr>
<tr>
<td>Radio equipment malfunction — ground</td>
<td>4.0%</td>
</tr>
<tr>
<td>Frequency congestion</td>
<td>4.0%</td>
</tr>
<tr>
<td>Sleeping VHF receiver*</td>
<td>4.0%</td>
</tr>
<tr>
<td>Pilot distraction</td>
<td>4.0%</td>
</tr>
<tr>
<td>Pilot expectation</td>
<td>3.0%</td>
</tr>
<tr>
<td>Controller workload</td>
<td>3.0%</td>
</tr>
<tr>
<td>Controller distraction</td>
<td>3.0%</td>
</tr>
<tr>
<td>Garbled message</td>
<td>1.0%</td>
</tr>
<tr>
<td>Pilot workload</td>
<td>1.0%</td>
</tr>
<tr>
<td>Blocked transmission</td>
<td>1.0%</td>
</tr>
<tr>
<td>Language problems</td>
<td>1.0%</td>
</tr>
<tr>
<td>Untimely transmission</td>
<td>1.0%</td>
</tr>
<tr>
<td>Controller nonstandard phraseology</td>
<td>1.0%</td>
</tr>
<tr>
<td>Ambiguous phraseology</td>
<td>1.0%</td>
</tr>
<tr>
<td>Partial readback</td>
<td>1.0%</td>
</tr>
<tr>
<td>Issue of a string of instructions to different aircraft</td>
<td>1.0%</td>
</tr>
<tr>
<td>Controller accent/non-native speaker</td>
<td>1.0%</td>
</tr>
<tr>
<td>Stuck microphone</td>
<td>0.4%</td>
</tr>
<tr>
<td>Pilot fatigue</td>
<td>0.4%</td>
</tr>
<tr>
<td>Long message</td>
<td>0.4%</td>
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<tr>
<td>Pilot nonstandard phraseology</td>
<td>0.2%</td>
</tr>
<tr>
<td>Controller high speech rate</td>
<td>0.2%</td>
</tr>
<tr>
<td>Controller fatigue</td>
<td>0.2%</td>
</tr>
<tr>
<td>Pilot high speech rate</td>
<td>0.0%</td>
</tr>
<tr>
<td>Pilot accent/non-native speaker</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

Contributing factors are based on analysis of 535 air-ground voice communication incidents in a study of European airspace, Oct. 25, 2004, through March 31, 2005. More than one contributing factor could be assigned to a single incident. *Sleeping VHF receiver is defined as a loss of communication type in which the VHF frequency becomes silent for a time.

Source: Eurocontrol

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Figure 1

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The study, *Air-Ground Communication Safety Study: Causes and Recommendations*, by Rombout Wever, Gerard van Es and Marcel Verbeek, is available via the Internet at <www.eurocontrol.int/safety/gallery/content/public/library/AGC%20safety%20study%20causes_recommendations.pdf>. It was released in January 2006.

Twelve airlines and 10 air navigation service providers participated in a confidential reporting project in which incident data were de-identified.

1. "Frequency change" included such events as the receiver tuned incorrectly, air traffic control (ATC) neglecting to hand off the flight to the next controller, the flight crew missing a call from ATC and radio equipment malfunction.

2. A "sleeping VHF receiver" problem was defined as a "loss of communication type in which the VHF frequency becomes silent for a period of time." It was a problem with the VHF receivers on the aircraft, not always recognized as such by the pilots and controllers.

3. In a "readback/hearback error," a pilot reads back the clearance incorrectly, and the controller fails to correct the error, or a pilot of the wrong aircraft reads back the instruction. Four of the 15 "incorrect readbacks" were reported as "readback/hearback errors" and therefore classified as such, although it was not specifically stated that the controller did not detect the incorrect readback.

4. In a "hearback error," a pilot reads back the clearance correctly, and the controller fails to notice his or her own error or fails to correct critical erroneous information in a pilot's statement of intent.

5. "Other communication problem" was a miscellaneous category for reported incidents that fit no other. Reported examples included, “Three aircraft with similar call signs are confusing ATC” and “there was some noise on frequency.”