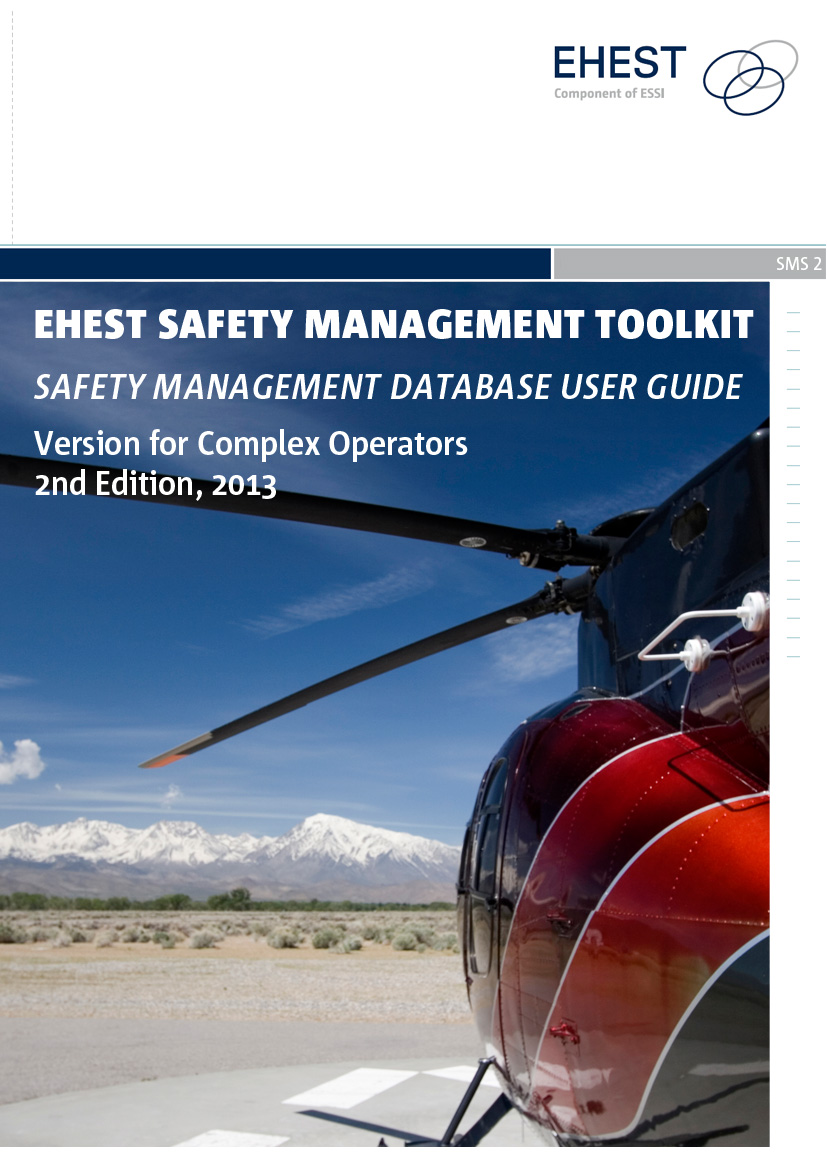
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***European Helicopter Safety Team***

**Safety Management Database**

**User Guide**

**Edition 2**

10 May 2013

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### 1. Risk Management and the Use of Safety Databases

The EHEST Safety Management Toolkit provides example registers of some of the typical helicopter hazards and risks developed by Eurocopter for Commercial Air Transport (CAT) operations. These registers of hazards and risks are a unique feature made available by the EHEST to the helicopter community for safety management purposes. It must however be taken into account that risks will differ depending on the operator, nature of operations and any existing barriers in place. So, the registers provided by the EHEST are just examples that need to be tailored by the operator.

Risk management is a continuous improvement process, in other words it must be subject to constant evaluation and updating.

Tools have been produced by the Specialist Team Operations & SMS of the European Helicopter Safety Team (EHEST), which are designed to assist in establishing an effective SMS and risk management process by setting out examples of the types of database that can be used.

It should be reiterated that helicopter operations involve exposure to hazards. These hazards, if not controlled or mitigated, can develop into the occurrence of Undesirable Events (UEs), which may ultimately lead to a loss of control on the situation. In such a situation the operator must then apply an appropriate control/mitigation strategy to prevent UEs from developing into an accident.

In the context of a Safety Management System (SMS), the operator must compile and maintain a database of the hazards relevant to their scope of operations.

A risk analysis must be conducted for each of the Undesirable Events. This analysis may or may not lead to the implementation of risk control/mitigation measures, depending on the level of acceptability of the risk identified.

The EHEST SMS approach considers the creation of at least the following three types of safety database:

1. A database listing the hazards to which an organisation is exposed.

2. A database of undesirable events and corresponding hazards.

3. A database of all other events/activities which may include exposure to risk.

Examples are provided for each of these three types of database as follows:

1. The "Hazard Identification.xls" Excel file for the database of hazards.

2. The "Undesirable Events.xls" Excel file for the database of undesirable events.

3. The "Risk Analysis.xls" Excel file for the database of other risks.

A fully functional SMS will involve listing each incident such that lessons can be learned from their analysis.

To that end an example of an "Occurrences Database.xls" file is provided.

The diagram in Figure 1 shows the relations between the various safety databases:

"Hazard Identification"

"Undesirable Events"

"Risk Analysis"

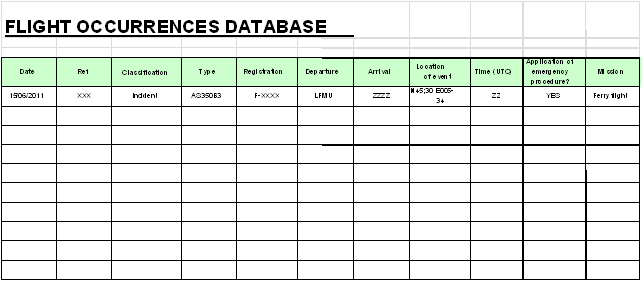
"Occurrences Database"

**Figure 1: The Safety Databases and their Relations**

### 2. Occurrences Database

This database lists all the occurrences (accidents/incidents) and the risk control/mitigation measures implemented.

An example of an "Occurrence File" is shown at Figure 2.



**Figure 2. Sample sheet from the "Occurrences Database.xls" file (partial view)**

The use of such a database allows for the classification of an occurrence into two categories, (1) in-flight occurrences and (2) maintenance occurrences. A third category in the file is used to record the risk control/mitigation measures. The file can be expanded to record all of the information required to accurately describe the occurrence.

In an effort to standardise inputs, and make the completion of the form simpler for the user, some of the data is available pre-completed from the drop-down menus. Examples of this are in the 'Phase of Flight', 'Visibility' or the 'Type of Event' fields.

Where an operator wishes to make any modification to the drop-down menu instructions are contained in the Excel Help File. To avoid unintended alterations to the drop-down menus, the "Lists" sheet in the file must not be deleted.

### 3. The Hazard Identification File

Once a hazard has been identified it must be subjected to analysis and, where appropriate, control/mitigation measures should be put in place to address the hazard. Each of the hazards and the control/mitigation measure implemented must be listed.

This process allows the hazards identified to be listed and classified into different categories as follows:

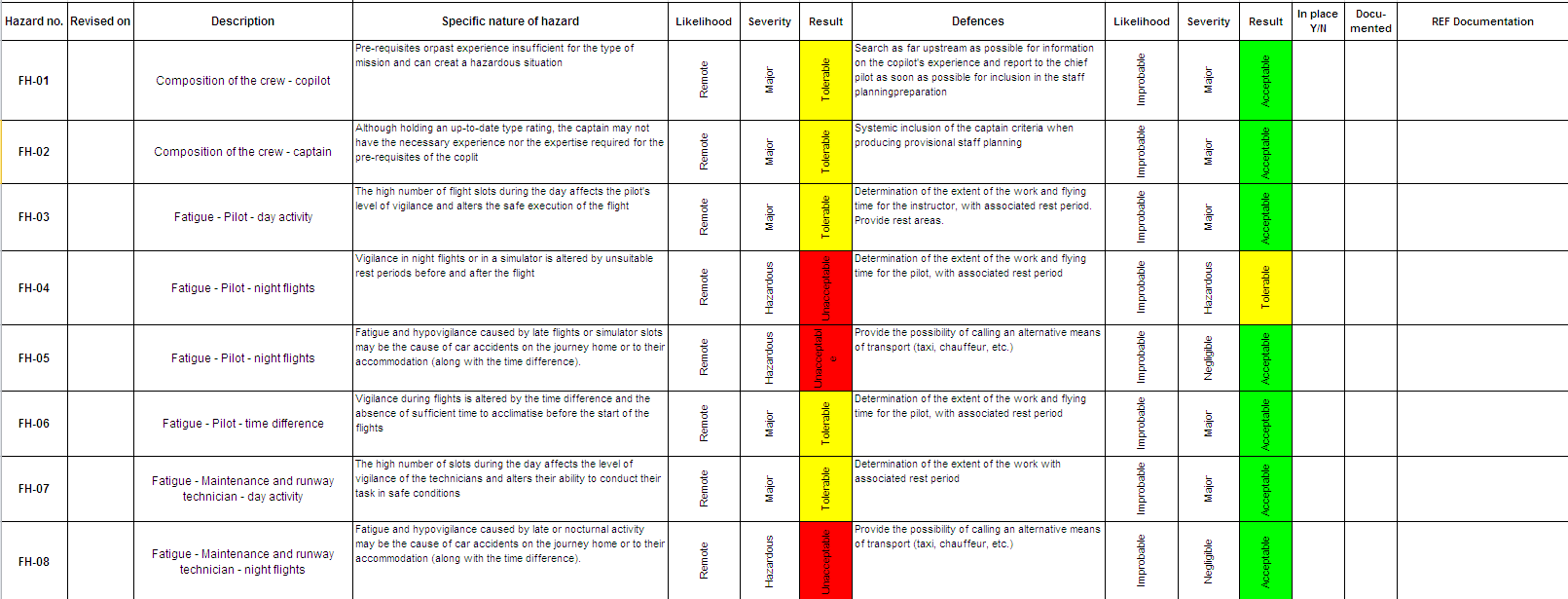
* Personnel - RH
* Human Factors - FH
* Environmental - ENV
* Maintenance - TEC
* Mission - MSN

The Hazard File should include a description of each of the hazards listed, their acceptability in relation to the likelihood of occurrence and their degree of severity if uncorrected. Control/mitigation measures for each hazard should also be detailed.

The last four columns for each hazard indicate the level of application and effectiveness of the control/mitigation measures taken. The Safety Manager is responsible for the completion of these columns.

Hazards should be assigned a code to be able to cross refer them to the undesirable events in the "Undesirable Events.xls" file.

An example of a Hazard Identification File is shown at Figure 3.



**Figure 3: Sample of Hazard Identification File**

### 4. Undesirable Events File

An undesirable event (UE) corresponds to a point where control of an incident situation is lost. Each UE corresponds to the presence of one or more hazards.

The UE file is compiled to facilitate the evaluation of such events. This file should contain a list of undesirable events which have been identified or which are liable to be encountered in the context of the organisations scope of operations (Commercial Air Transport (CAT), Specialised Operations (SPO), etc.). The UE file should also contain associated hazards previously identified which may lead to a UE and examples of control/mitigation measures implemented in order to address them.

Notes:

1. The lists of occurrences, hazards, and undesirable events provided are not exhaustive and should be subject to continuous monitoring and updating within the SMS.

2. The Undesirable Events Excel file consists of several sheets.

3. The examples contained in the sample UE Excel file relate only to CAT operations it is essential, therefore, for operators involved in other types of operations to compile similar detailed lists relative to their scope of operation.

## 4.1 Sample "Commercial Air Transport " UE Sheet

Within the "Undesirable Events.xls" file there is a sample sheet which provides a table of UE related to CAT operations. This sheet lists some of the identified CAT UEs and gives their degree of severity according to the flight phase.

An example of this sheet is shown at Figure 4.



**Figure 4: Sample of "Undesirable Events.xls" Sheet for CAT Operations**

## 4.2 "Risk Matrix" Sheet

A matrix is used to determine the level of acceptability of each of the risks identified.  
A sample of the "Matrix" sheet is contained in the UE.xls file which shows the classification for each of the levels of acceptability, of likelihood and severity.

## 4.3 "UE xx" Sheets

The sample UE.xls consists of 20 sheets numbered "UE 01" to "UE 19" and also a blank UE sheet. These sheets should be adapted to the needs of the operator as necessary.

The hazards associated with a UE, as well as the number of events, may evolve as they are subjected to continuous assessment by the SMS.

The sheets should show the identified hazards for each UE as well as the different elements which characterise them as set out in the Hazard Identification file as follows:

1. Their description

2. An example of control/mitigation action to be implemented, which will increase the level of acceptability of the risk.

3. A description of the level of implementation of the control/mitigation action(s) and their effectiveness as required in the last 4 columns for each hazard.

Figure 5 gives an example of one of the "UE XX" sheets.



**Figure 5: Sample of Sheet "UE 01"**

### 5. Risk Analysis Monitoring Sheet

As in the case of Undesirable Events, the operator's scope of activity must be continuously analysed. As a result it may then be necessary to implement additional control/mitigation measures to address any additional hazards and risks identified.

It is therefore recommended that for each analysis a "UE xx" sheet from the "Undesirable Event" file is used for this purpose.

To initiate an analysis a search of the Hazard Identification file should be carried out for all the hazards pertaining to the scope of activity being considered.

If, during the analysis, a new hazard is identified, it must be recorded in the Hazard Identification file before initiating a risk analysis.

The monitoring of the implementation of hazard identification and risk analysis can be recorded on the "Risk Analysis.xls" file.

Figure 6 gives an example of a "Risk Analysis" sheet.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Risk Analysis Sheet**  **Updated on:** | | | | | | | | | | |  |  |  |  |  |
| **REF** | **Date** | **Evaluated activity** | **Likel.** | **Severity** | **Risk level** | **Risk Controls** | **Likel.** | **Severity** | **Risk level** | **Action Nr.** | **Description of actions** | **Resp.** | **Lead time** | **Status** | **Closed** |
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**Figure 6: Example of "Risk Analysis" Sheet**