

AGARD

ADVISORY GROUP FOR AEROSPACE RESEARCH & DEVELOPMENT

7 RUE ANCELLE, 92200 NEUILLY-SUR-SEINE, FRANCE

AGARD LECTURE SERIES 208

Injury Prevention in Aircraft Crashes: Investigative Techniques and Applications

(la Prévention des lésions lors des accidents d'avions :
les techniques d'investigation et leurs applications)

The material in this publication was assembled to support a Lecture Series under the sponsorship of the Aerospace Medicine Panel and the Consultant and Exchange Programme of AGARD presented on 24-25 November 1997 in Farnborough, UK, and 1-2 December 1997 in Madrid, Spain.



North Atlantic Treaty Organization
Organisation du Traité de l'Atlantique Nord

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According to its Charter, the mission of AGARD is to bring together the leading personalities of the NATO nations in the fields of science and technology relating to aerospace for the following purposes:

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- Providing scientific and technical advice and assistance to the Military Committee in the field of aerospace research and development (with particular regard to its military application);
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14. Abstract <p>This Lecture Series addresses a critical aspect of the investigations related to the factors implied in the prevention of potential injuries among aircraft occupants as a consequence of impact and post-crash fires, heat and toxic fumes. It comprises a review of the critical aspects of injury prevention.</p> <p>The topics covered include a description of the acceleration vectors involved, how they may have an influence on the aircraft, and how the acceleration forces might be tolerated by the aviator. In addition, the physical analysis of impact and crash survivability is discussed, focusing on what happens during a mishap. Furthermore a review is made on how to evaluate the tolerable deceleration forces and occupiable space required to sustain life.</p> <p>A part of this LS is devoted to answering questions such as, when did the injury occur, the nature of the forces that produced the injury, and their relationship to a mishap. Injury types related to the thermal and intrusive impact of the deceleration forces are also discussed, as are aspects related to the collection of medical information that would help identify the potential causes and the effects on an individual; in particular, the way in which the occupant moves in response to the forces applied. These forces may have a profound effect upon the nature and severity of the injury.</p> <p>This Lecture Series, sponsored by the Aerospace Medicine Panel of AGARD, has been implemented by the Consultant and Exchange Programme.</p>													

Injury Prevention in Aircraft Crashes: Investigative Techniques and Applications

(AGARD LS-208)

Executive Summary

The Aerospace Medical Panel (AMP) of the RTO (former Advisory Group for Aerospace Research and Development - AGARD) organised LS 208 on "Injury prevention in aircraft crashes: investigative techniques and applications" to review the status and future direction of the investigative techniques applied to aircraft accident investigation.

Survivability in aircraft crashes has been an area of major concern in military and civil aviation. Injuries occurred in survivable crashes can be prevented with improvements in aircraft effective crashworthiness, design criteria, personal protective equipment and flight escape systems. To effectively develop preventive strategies and equipment requires knowledge in the field of human tolerance to impact, aircraft crash dynamics and a deep understanding of the mechanism of injury.

The Lecture Series will focus on techniques for assessing injury crashes and the utilization of this data in the development of intervention strategies.

Topics to be covered will include:

- Human tolerance to abrupt acceleration
- Crash force estimation
- Principles of crash survivability
- Injury assessment

The main objective of this LS is to review among aircraft accident investigators, flight surgeons, managers, flight safety officers and engineers, the principles of injury prevention and survivability criteria in aircraft crashes.

This Lecture Series, sponsored by the Aerospace Medicine Panel of AGARD, has been implemented by the Consultant and Exchange Programme.

La prévention des lésions lors des accidents d'avions : les techniques d'investigation et leurs applications

(AGARD LS-208)

Synthèse

Le Panel de médecine aérospatiale (AMP) de la RTO (anciennement AGARD) a organisé le Cycle de conférences 208 sur "La prévention des lésions lors des accidents d'avions : les techniques d'investigation et leurs applications", afin de faire le point de l'état actuel des techniques d'investigation mises en œuvre suite aux accidents d'avion, ainsi que de leurs orientations futures.

La survie en cas d'écrasement au sol des aéronefs est un sujet de préoccupation majeur pour l'aviation civile et militaire. Les blessures non mortelles occasionnées lors des accidents d'avion pourraient être évitées moyennant l'amélioration de la résistance à l'écrasement des aéronefs, l'établissement de meilleurs critères de conception, la mise à disposition d'équipements de protection individuelle et le perfectionnement des systèmes d'évacuation. Le développement effectif de stratégies et de matériel préventifs passe par les connaissances en matière de la tolérance humaine aux impacts, de la dynamique des écrasements au sol, et de la compréhension des mécanismes de blessure.

LS 208 porte essentiellement sur les techniques employées pour l'évaluation des lésions dues aux accidents d'avion et sur l'utilisation de ces données dans l'élaboration de stratégies d'intervention.

Les sujets examinés comprennent entre autres:

- La tolérance humaine aux accélérations brutales
- L'estimation des forces en jeu lors des écrasements au sol
- Les principes de l'aptitude à la survie en cas d'accident d'avion
- L'évaluation des blessures

L'objectif principal de ce Cycle de conférences est de faire le point des critères régissant la prévention des blessures et l'aptitude à la survie lors des accidents d'avions dans un forum qui rassemble les enquêteurs d'accident, les officiers de la sécurité aérienne, les ingénieurs et les gestionnaires de la sécurité des vols.

Le Cycle de Conférences No. 208 de l'AGARD a été organisé par le Panel de Médecine Aérospatiale, sous l'égide du Programme des consultants et d'échanges.