

HARDY, D. M.

Project Management—A Science, An Art or An Organisation Problem

The Management Studies Group of the Society held a discussion evening on the above subject on 9th January 1968. Papers were presented by Air Cdre. R. E. W. Harland, and Mr. J. G. Keenan. These papers were published in the Journal, Vol 71, pp 821-826, December 1967. The discussion was opened with a short paper by Mr. D. M. Hardy.

HUDDIE, SIR DAVID

Economics of Propulsion Systems for Air Transport

Compared with other industries a distinguishing feature of the air transport business throughout its history has been the rapid development and replacement of its flying equipment. Aircraft have evolved to meet the needs of expanding traffic and each generation has been succeeded by different, newer and better versions. This paper covers history, economics of size, the propulsion system contribution to operating economics, maintenance costs, launching cost and market requirements and prospects.

ANDREWS, E. J.

The External Aerodynamics of Hovercraft

A first generation of commercial hovercraft have now been operating on a scheduled basis with revenue payloads over various relatively short over-water routes. On some of these routes, open-sea conditions prevail. From a technical point of view, the degree of success attained may be considered as encouraging provided that solutions can be found for the many problem areas that have been brought to light.

Among these problem areas is one associated with handling qualities, primarily that of the stability and control of the hovercraft. In the case of the amphibious hovercraft, the problem is particularly complex on account of both aerodynamic and hydrodynamic effects in conjunction with air-cushion effects. Additionally, there are interference effects at the aero-hydro-interface.

The paper presents some of the results obtained from a programme of research into the external aerodynamics of hovercraft that has been conducted at Cranfield.

STEINER, J. E.

Aircraft Development and World Aviation Growth

The route of aviation progress has been one of immense challenges, of capable and dedicated people, of enormous risks, and of equally great progress. It has been said that air transport is the second greatest single contributor to rate of economic growth, exceeded only by education. As time has passed, the courage of, and the risks to, individuals have changed to the courage of, and the risks to, corporations. No other industry in so short a time has stimulated so many to do so much for rewards which often were not of a material nature. This paper concerns these accomplishments, some of the risks taken, the growth of the air transport industry and the growth which can be forecast over the area traversed by the "Southern Cross" 41 years ago.

ELLISON, A. P.

The Edwards Report and Civil Aviation in the 1970s

The Edwards Report is the first comprehensive survey of British Civil Aviation for over 30 years, and it recognises this fact by supplying detailed examination of many aspects of the industry. In this review of the report, selection is made of what appears to be the salient policies of the report and around which the other recommendations follow.

SCHIJVE, J.

Cumulation Damage Problems in Aircraft Structures and Materials

As an introduction to the main theme of this paper a brief analysis is given of the various phases of designing, testing and utilizing an aircraft as far as fatigue considerations are applicable. Fatigue damage, damage accumulation and interactions between cyclic loads of different magnitudes are defined. An extensive test series on crack propagation in 2024-T3 and 7075-T6 sheet material under flight-simulation loading was recently completed at the NLR and the results will be presented. Aspects investigated were: (1) Truncation of high amplitude gust cycles, (2) omission of low-amplitude gust cycles, (3) omission of taxiing loads, (4) omission of the ground-to-air cycles, (5) application of a single gust cycle per flight, (6) programming the gust cycles within each flight in comparison to the random sequence, (7) reversal of the up- and downward gust cycle sequence. The analysis of the empirical trends includes a survey of relevant literature. In the discussion the merits and problems of flight-simulation tests are examined and a number of recommendations are given.

HEATH, B. O.

Panavia—MRCA

The organisation of Panavia and its partner firms, Messerschmitt-Bolkow-Holthm, Fiat and BAC are presented against a background of a progressive co-operation since mid 1968 on the MRCA together with associated activity on engines and avionics. Technical progress is described (within the limits of security) illustrating the background of technical work within the partner firms, the formulation of joint requirements against a re-examination of fixed and variable sweep wings, ground work leading to a common design and subsequent consolidation.

The relation of the organisation in Munich both official and industrial, to that of the partner companies in their national bases is described with particular reference to division of work, cost and programme control, production, procurement and system engineering.

STEPNIEWSKI, W. Z. and KALMBACH, Jr., C. F.

Multivariable Search and Its Application to Aircraft Design Optimisation

The growth of modern optimisation ideas is traced through the centuries and general advantages of the application of optimisation to engineering design and operational problems is indicated. Difficulties that have been encountered in the practical application of optimisation to engineering practice are briefly discussed and new techniques, better suited for that role of a design tool are indicated. Various aspects of the mathematical model formulation are considered, including the importance of constraints and various methods of handling constraints. Basic strategies in the search for an optimum, as well as various search techniques are briefly reviewed. Conglomeration of all those previously reviewed techniques into a single program called AESOP is explained and its general suitability as a design tool is outlined. Several examples of the application of AESOP to the solution of various engineering and scientific problems, including the case of an optimal design of a hypersonic cruise vehicle, are given. Additional examples include the task of maximising the static figure of merit of rotors and propellers, and discussion of a STOL design optimisation.

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