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CURRENT JAPANESE ACTIVITIES OF AEROENGINE DEVELOPMENT

National Aerospace Laboratory

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INTRODUCTION

Aeroengine research and development activities in Japan are introduced briefly. They are largely devided into two categories: government funded R&D and civil engine development works. The former activities includes a development of military engines. The latter developments are mainly made with foreign partners.

GOVERNMENT R&D ACTIVITIES

HYPER PROGRAM

This program is promoted by the Agency Industrial Science and Technology, the Ministry of International Trade and Industry. Research and development works are carried out with the cooperation of national research institutes, domestic and foreign aircraft engine companies.

This program aims to establish technologies for super/hyper-son transport propulsion systems, which enables flight up to the flight speed of Mach 5. The system is expected to have the performance with low fu consumption and less environmental effects. They expect the technology required will also contribute the advanced technologies for industrial gas turbines.

SPACEPLANE ENGINES

The Institute of Space and Aeronautical Science(ISAS) is conducting the research work on an expander cycle air-turbo-ramjet(ATR) engine with the corporation of major aircraft engine manufactures. This engine is intended for use as a flyback booster of the two-stage-to-orbit vehicle.

The National Aerospace Labortory is also conducting independent research work for the air-breathing engine for a single stage to orbit plane. Addition to the hydrogen fueled subsonic ramjet engine which will be used up to the flight speed of Mach 6, supersonc combustion ramjet(SCRAM) engine is also investigated. The facilities for the test up to Mach 8 conditions are provided and are now served for the optimum design.

SMALL JET-ENGINE FOR SUPERSONIC FLIGHT VEHICLE

The National Aerospace Laboratory are planning to establish a aerodynamic design technique with the use of computer assisted numerical simulation for a supersonic flight vehicle. The small engine design and tests are involved in the program. The altitude test facilites for the engine are now planned.

TECHNICAL DEMONSTRATOR ENGINE by JDA

Technical Research and Development Institute of Japan Defence Agency has a technical development program for an advanced turbofan engine with an afterburner. It has the performance of approximately 50 kN in the thrust level.

CIVIL ENGINES

1. PW4090, GE90-92B and TRENT 892

These engines have thrusts exceedily 400kN and are produced for B777. Major Japanese engine manufacturers, MHI, KHI and IHI are involved in the production as risk-sharing partners.

2. V2500

Three major aircraft engine manufactures, IHI, KHI and MHI, are participated in the production of V2500 forming consortiam, the Japanese Aero Engine Corporation(JAEC). They cooperated with four oth nations as a risk sharing partner. The series of this engines are used mainly by the Airbus familiy airplanes.

3. CF34-8C1

This is a relatively small engine intended for a regional aircraft with 50 to 90 seats. IHI and KHI in conjunction with JAEC a participating in the development program lead by the General Electric Company. The program is proceeded to the first engine test run in 199

CLOSING REMARK

Government research institutes and Japanese manufactures are proceeding to get the technical ability for super and hypersonic flight vehicle engines. Three major aircraft manufactures are participating various international production engine programs as risk-taking partners. Intensive international cooperation among nations will be expected more and more in the 21st centurey.