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MMC Activities

Overview of MMC's Activities in Fiscal 2005

I. Basic Objectives of Activities

The basic objectives of MMC activities are, firstly, to establish basic micromachine technologies and increase utilization of micromachines through promoting research and investigation of micromachines (MEMS and other minute machines and systems), collection and provision of micromachine information, and exchange and cooperation with worldwide organizations; and secondly, to contribute to the further development of Japan's industrial economy and to international society.

MMC's basic objectives in Fiscal 2006 are, as in the previous fiscal year, to promote the industrialization of micromachines/MEMS and to strive for the establishment of next generation basic micromachine and MEMS technologies in accordance with trends in cutting-edge technological fields such as biotechnology, nanotechnology, and IT.

Furthermore, a MEMS Council comprising MEMS-related businesses will be established in April. The council will aim to provide support for the further development of MEMS industries and contribute to the strengthening of the international competitiveness of Japanese industry.

II. Description of Primary Activities

1. National/NEDO Project-related Activities

To enable the establishment of basic micromachine technologies, MMC is mobilizing the strengths of industry, academia, and government bodies to proactively promote national government/NEDO R&D projects. In Fiscal 2006, the MMC plans to continue to promote the MEMS Open Network Engineering System of Design Tools Project as well as begin work on the new High Integration/Combination MEMS Production Technology Development Project.

(1) MEMS-ONE: MEMS Open Network Engineering System of Design Tools Project (NEDO-commissioned project)

The MMC will cooperate with the 7 companies and 13 universities participating in the project as well as the National Institute of Advanced Industrial Science and Technology (AIST) to promote the project, now in its final year, developing and completing an open network engineering system of design tools for MEMS that is easy for researchers in other fields and the uninitiated to use. Efforts will focus on: (i) the collection of intellectual data of universities, corporate researchers and technicians that have a track record in world-class cutting-edge MEMS research and development and data on material properties from a diversity of materials businesses in Japan; and (ii) under the guidance of the project leader and sub-leader, playing a management role in overseeing the promotion and progress of the project overall to ensure that the ultimate goals specified for the project are realized.

(2) Studies on MEMS-ONE Propagation Activities (NEDO-commissioned project)

In parallel with the MEMS-ONE project, frameworks for the promotion of MEMS-ONE diffusion after completion of the MEMS-ONE project will be constructed during Fiscal 2006 and preparation made so that operations can begin smoothly after April 2007. To this end, further study will be conducted regarding such issues as conceptualization of the operating system for MEMS-ONE system maintenance, how best to approach researchers and technicians (the anticipated users of MEMS-ONE), technological and legal preparation for beginning system operations, and creation of an economic foundation for operations. The MMC plans to undertake these tasks in collaboration with software companies involved in the MEMS-ONE project.

(3) High Integration/Combination MEMS Production Technology Development Project (Planned project)

NEDO will be calling for participants in this National Project for Fiscal 2006. In this project, the MMC plans to prepare a high integration/combination MEMS knowledge database that collects, organizes, and arranges knowledge information related particularly

to 3 issues in the development of concentration/combination MEMS: (i) combination of MEMS and nano functions, (ii) integration of MEMS and semiconductors, and (iii) MEMS and MEMS high integration unification. The MMC also intends to provide support for the overall management of the project.

2. Activities of the MEMS Council (Policy Proposals, Industry Exchange, Revitalization Activities)

In April a special committee, the MEMS Council, will be established for the purpose of providing further support for the MEMS industry. Comprising MEMS-related businesses, the MEMS Council aims to promote policy proposal, industry activities, and revitalization activities, thus contributing to the strengthening of the international competitiveness of the MEMS industry in Japan.

(1) Policy Proposals

Through exchanges of opinion between MEMS Council members and representatives of the government and MEMS-related industries at MEMS Council Promotion Committee meetings, as well as by holding MEMS forums, the MMC will proactively present proposals concerning MEMS policies.

(2) Coordination with Industry and Academia

Interested business members will gather together for study groups on particular topics. In order to encourage the development of bedrock state-of-the-art micro/nano technologies, we need a place where information about new technologies can be exchanged, and topics for further research and study identified. The "Micro/Nano Cutting Edge Technology Exchange", which will be held once again this year, will provide a forum to meet these needs. The MMC intends to further raise the number and quality of these exchange meetings in Fiscal 2006.

(3) Preparation of an Infrastructure for MEMS Development

(i) Expansion and Strengthening of a Foundry Network System

Foundries are vital to the industrialization of MEMS. In order to improve these facilities, we will undertake the establishment of a system to improve services through a network comprising members of the Foundry Service Industry Committee, who represent businesses either involved in or related to the provision of foundry services.

(ii) Promoting the Diffusion of MEMS-ONE

The MMC will promote the diffusion of MEMS-ONE (MEMS Open Network Engineering System of Design Tools) services, due to begin from Fiscal 2007, and support the efficiency of MEMS design and development environments.

(iii) Strengthening of Coordination between Public Foundries in Each Region and Regional Clusters

Cooperation with public research institutions and regional clusters throughout Japan that proactively support MEMS development will be strengthened.

(iv) Promotion of Human Resource Training

The MMC will support the training of people involved in MEMS development through the implementation of MEMS lectures and internship support (creating a notice board of companies offering internships, etc.)

(4) MEMS Business Exchange in Japan and Abroad

(i) Establishment of an MEMS Mall

A "MEMS MALL" (tentative name; will be combined with the Council website) website introducing the activities of MEMS Council members as well as new products and technologies will be established on the Internet with the aim of providing support for MEMS businesses.

(ii) Mega Event: The 2006 International Micromachine/Nanotech Symposium

In order to promote industrial exchange in the MEMS field, Micro/Nano 2006: the 2006 International Micromachine/Nanotech Symposium (partly sponsored by the Japan Auto Racing Association) will be held in November at the Tokyo International

Forum. In addition to the Micromachine Exhibition and Symposium held every year, this mega event will also include the Presentation of MEMS-ONE Results, MEMS Forum, and other special events.

(iii) Participation in the 12th Micromachine Summit

MMC will participate in the 12th Micromachine Summit in Beijing, China, taking part in discussions of a wide range of topics, including worldwide trends in micromachine technology and its fields of application.

(iv) Creation of an International Network of Affiliates

The MMC will create a network of affiliates for the MEMS Council comprising micro/nano-related organizations and research institutions both in Japan and abroad, establishing a system in which the Council can function as a hub for micro/nano industrialization. In addition to relevant organizations in Japan, affiliations will be established with micro/nano-related organizations and research institutions in Europe, the United States, and Asia and support provided with regard to information exchange, distribution of newsletters, and events.

(v) International Exchange and Dispatch of Researchers

A group will be dispatched overseas to promote the exchange of information and opinions with micromachine-related research institutes in universities and similar institutions. This group will also participate in international symposiums and academic meetings held overseas. MMC will further promote exchange by inviting experts in the field from America and Europe and by sending our experts and researchers overseas.

3. Survey Research Activities

Planned activities in the field of micromachine/MEMS technology, which is becoming a key technology for the manufacturing industry, are aimed towards gaining a clear understanding of the trends in micromachine technologies and industries and conducting investigations of and research on new technological issues regarding the fusion of micro- and nano-technologies.

(1) The MMC will conduct survey research of future device technology that can be realized through the technological integration of nano and bio (nano-fusion) and other technologies that will have a revolutionary impact on society in 20 years from now, expanding on the results of the long-term vision round-table conference held in Fiscal 2005 to survey research on future device technology (application submitted to the Mechanical Social Systems Foundation as a commissioned project) arising from nano-fusion – the frontier of MEMS technology. Working groups will be set up to investigate 3 target fields – environment/energy (green devices), health/medicine (white devices), and safety/security (blue devices) – and process integration.

(2) Studies on R&D Trends for Micromachine Technology in Japan and Abroad

These studies aim to identify and analyze the latest trends in the field of micromachine technology, which is progressing at a remarkable pace, and micromachine R&D in Japan and abroad; and to develop basic technological data to aid in developing micromachine technologies.

(3) Survey Research on the MEMS Market

Using the MEMS market survey methods established with the “Survey Research on the Analysis of the Current Conditions in MEMS-related Markets and Japan’s Competitiveness” conducted in Fiscal 2003, the MMC will conduct rolling research concerning MEMS market trends and future predictions, with particularly detailed analysis of products containing MEMS.

(4) Enhancing the Micro/Nano Database

The MMC website database will be further enhanced to enable supporting members to search for publicly disclosed documents and survey reports, research center maps, mini-research reports, and other information.

4. Standardization of Micromachines

In cutting-edge technological fields such as micromachine/MEMS, standardization is being promoted as international initiatives are being taken.

(1) Research on MEMS Standardization Roadmap

With regard to survey research on a roadmap for MEMS standardization, the MMC will develop a roadmap for MEMS standardization that enables strategic and ongoing efforts in fields in which Japan can likely achieve a competitive edge in order to maintain and strengthen the international competitiveness of our MEMS industry.

(2) Response to International Standardization Activities Overseas

In response to the rapidly increasing number of MEMS international standardization proposals by the ROK and other countries, the MMC will consider Japan’s approach (particularly concerning RF-MEMS, splicing, and packaging).

(3) Promotion of the International Standardization of Tensile Testing Methods for MEMS Thin Film Materials

In addition to continuing to follow up the situation regarding tensile testing methods, which are currently at the CDV (Committee Draft for Vote) stage, in April the MMC will also submit a NP (New Proposal) regarding fatigue testing. The MMC will also aim to submit new standardization proposals through round robin tests with a view to the international standardization of life testing and other testing methods.

(4) Standardization of Micromachine Terminology

The micromachine terminology adopted last fiscal year as an IEC standard will be considered for JIS approval.

5. Dissemination of Information and Education about Micromachines

By issuing and distributing quarterly magazines and by holding exhibitions, we hope to disseminate information on micromachines extensively in order to educate as many people as possible.

Furthermore, information and documents on micro/nano-machine use in universities, industries, and public organizations in Japan and overseas will be collected, combined with survey results and MCC-produced documents, and made freely available in the MMC library. At the same time, information will be disseminated widely, both domestically and internationally, through the MCC website.

(1) Improved Dissemination and Exchange of Information through the MCC Website

Utilizing the MCC website, efforts to exchange and disseminate information will be made proactively. Website content aimed at supporting members will be enhanced.

(2) Publication of a Micro/Nano Public Relations Magazine

A public relations magazine will be published periodically and distributed to those in or connected with the field; it will also be made available on the Internet through the Center’s home page. The magazine’s title will change from the April 2006 edition from “Micromachine” to “Micro/Nano”.

(3) Publication of a Monthly Newsletter

Information concerning research and governmental trends related to micro- and nano-machines is distributed monthly via the “MMC/MIG News” to supporting members, MEMS Council members, and other interested individual and organizations.

(4) Provision of Information through the MicroNano Express Newsletter

Through the MicroNano Mailing list, information concerning micro/nano-machine events or industry-academia-government collaboration is distributed as required via the “MicroNano Express” newsletter to supporting members, MEMS Council members, and other interested individual and organizations.

(5) Maintaining and Upgrading the MMC Library by Expanding the Literature Abstract Database

“Micromachine Index,” an information magazine containing abstracts of technical documents and information on materials, is issued on a regular basis and provided to supporting members and organizations concerned with micromachines. Collected technical documents and materials are stored and maintained in the MMC library and made available to the general public.

(6) Micromachine Exhibitions

The 17th Micromachine Exhibition and other events will be held to present the latest research achievements, as well as the latest cutting-edge micromachine/MEMS industry-related products and product materials, as part of the 2006 International Micromachine/Nanotech Symposium. The venue for this year’s symposium has changed from the Science Museum, Tokyo, to Tokyo International Forum. The symposium is to be held from November 7 (Tue.) to 9 (Thu.), 2006.

**Upcoming Event Announcement
The 2006 International Micromachine/Nanotech Symposium**

Venue: Tokyo International Forum (Yurakucho, Tokyo)

1. The 17th Micromachine Exhibition

November 7 (Tue.) – 9 (Thu.), 2006

2. MEMS Forum

November 7 (Tue.), 2006

**3. The 12th International Micromachine/
Nanotech Symposium**

November 8 (Wed.), 2006

4. Presentation of MEMS-ONE Results

November 9 (Thu.), 2006

* The International Conference on Miniaturized Systems for Chemistry and Life Science (µTAS2006) will also be held.

