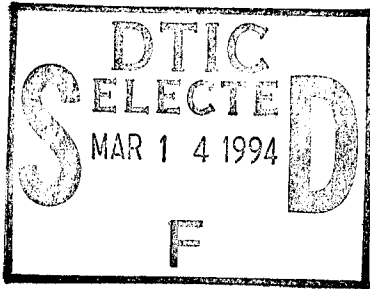


AOARD REPORT

Eye Safe Laser Joint Working Group



Jun 15-16 and 21 1993

S. J. Yakura

AOARD

The U.S.-Japan eyesafe laser working group meeting was held on 15-16, 21 Jun. 93 at the Japan Defense Agency's Technical Research Defense Institute (TRDI). The group discussed the framework for a U.S.-Japan eyesafe laser collaborative research project under the scheme of the Science and Technology Forum. Also discussed was the coordination effort between the U.S. Army Communications-Electronics (CE) Command (Mr. Wayne Grant) and the TRDI 2nd Research Center (Dr. Hideaki Saito). The main purpose of the project is to share technical data, exchange scientists, evaluate laser designs, and test the performance of laser devices. This proposed project is scheduled to last for five years, starting in 1994 and ending in 1999.15-16 and 2111

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To: Dr Shiro Fujishiro
From: Dr S. Joe Yakura

cc: Lt Col David Crawford

Date: 25 June 1993

Subject: Trip Report - Eye Safe Laser Joint Working Group
15-16 and 21 June 93

ABSTRACT:

The U.S.-Japan eyesafe laser working group meeting was held on 15-16, 21 Jun 93 at the Japan Defense Agency's Technical Research Defense Institute (TRDI). The group discussed the framework for a U.S.-Japan eyesafe laser collaborative research project and its coordination efforts with the U.S. Army CE command (Mr. Wayne Grant) and the TRDI 2nd research center (Dr. Hideaki Saito). The main purpose of the project is to share technical data, exchange scientists, evaluate laser designs, and test the performance of laser devices. This proposed project is scheduled to last for five years, starting in 1994 and ending in 1999.

Purpose: Participated in eye safe laser joint working group

Participants:

US Side: Mr Wayne Grant (Army CE Command - Co Chairman of the EyeSafe Laser JWG), Lt Col David Crawford (Defense Technology Office/MDAO), Col Thomas DeLuca (MDAO), and myself

Japanese Side: Dr Hideki Saito (TRDI - Co Chairman of the EyeSafe Laser JWG), for others see Attachment #1.

Comments and Observations:

- The object of the eyesafe laser joint working group is to discuss coordination efforts between the US Army CE COMmmand and the TRDI 2nd research center in setting up the framework for eyesafe laser collaborative research. The intent of this second meeting, following the first meeting that was held December of last year in Washington, D.C., is to establish DEA and MOU for the purpose of sharing technical data, exchanging scientists, evaluating laser designs, and testing the performance of laser devices. This project is proposed to last for five years starting in 94 and ending in 99.

- Before starting the technical discussions, we made courtesy visits to Director General of TRDI Dr Sachio Uehara, Director of the 2nd Research Center Dr S. Nakano, and Director of Plans and Programs Department Mr Ito. They were really supportive of the US-Japan corporative program to develop eyesafe lasers. Dr Nakano, who is retiring within 6 months, wanted to see an MOU signed before he retires.

- Technical discussions were centered around technical and administrative issues presented by Japanese and US sides. The Japanese side first presented what they think about each side ought to do. The proposal consisted of the Japanese side to consider eyesafe lasers candidates that will operate at 2 microns

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and use Er, Tm and Ho ions as active emission elements, and the US side to use OPO NdYAG lasers that will operate at 1.5 - 2.0 microns. For image detections, both sides use direct and coherence detections. On the detection issue, Mr Wayne Grant of CECOM, US Army objected an idea of doing both for the US side. The US side is proposing to do the direct detection only. With much disappointment to the Japanese scientists, they agreed that is OK at this moment and will discuss more in detail in the next meeting. The reason for not pursuing the coherent detection by the US side is that Mr Grant does not think the coherent technology has matured enough to take the risk at this point.

- In testing and evaluating eyesafe lasers, there will be cooperative collaborations in checking each other's laser device by performing the field tests (field means that the test is carried out outside, not inside the laboratory) at some appropriate Japanese and US field testing grounds that are to going to be specified later.

- The Japanese side estimated the cost of this program to be around \$15 M. The US side estimates the cost to be around \$5 M. Because the Japan Defense Agency does not provide any in-house production capabilities to TRDI, the Japanese side has no choice but to use contractors. This naturally results in high estimated costs. On the other hands, the US side uses in-house CECOM production capabilities and build a laser device using somewhat proven technology. The result is the lower estimated costs. In the future meeting, this cost difference has to be discussed more in detail.

- Dr Saito, program co-chairman from the Japanese side, expressed a concern in the way the performance requirements are established for US and Japanese built lasers. His concern stems from how the Japanese contractors perceive the laser development efforts. He did not want the Japanese contractors to feel they are competing against US technologies. He suggested to have two different sets of performance specifications, where one set is used by the Japanese and another by the US. After a lengthy discussion, we agreed that it is best to have one set for test and evaluation purposes. However, we have to make sure that there is a close working relationship between Japanese and US sides during the developmental stage as to create the benign working atmosphere for both sides to exchange information freely. At the end of the project, each side comes out feeling well that they accomplished their developmental efforts together and also gained additional knowledge about other competing technology.

- From the administrative side, there were few wording changes required in a document. The Japanese side requested to delete all statements that have any financial implications due to their bureaucratic procedures which require no statement regarding any financial information to be included therein the official program document. It seems that it is a part of the Japanese government requirement such information is addressed by the Minister of Finance and JDA has no jurisdiction over the deciding how much the program should cost. By agreeing to the changes, Mr Grant did not think that this would alter the technical points addressed by the US side in the proposed document.

- It is agreed that in next S&T Forum (scheduled in Nov 93), the eyesafe laser program committee requests an approval by S&T Form general committee members to proceed with signing of an MOU for this joint program.

- JDA arranged a visit to Sharp Corporation in Tenri, Nara on 21 June 93. We were first greeted by Dr Akira Fujisawa, Center General Manager of the Multimedia Systems Research and Development Center of Sharp Corporation, at JR Kyoto Station. At Sharp Corporate Research and Development Group, located in Tenri, Nara, we were greeted by senior executive director Ichio Fujimoto and general manager Dr Hiro Kawamoto. These are two top executive officers at this research center. Discussions were not technical in nature, but it was more on the general operation of Sharp Corporation and their contributions to the electronics industry in Japan and around the world.

- Later we had a laboratory tour given by Dr Yoshiro Akagi, manager of materials research and analysis group. He showed us laboratory equipments that use ion and electron beams to investigate the surface characteristics of materials. Later we visited an office for his engineers. Surprisingly there were only few PCs in the office that were shared by all the engineers in that office. On top of it there was no local area network system laid out within the building. It seems that Sharp Corporation is willing to spend a lot of money on state of the art equipments for research purposes but not on computer systems for engineers to use the advance Japanese technologies. It is a bit of irony to see that Sharp Corporation is not proving the their advanced technologies to their own workers but rather to the people outside their own company, namely to the consumers.

Summary:

The US-Japan program on eyesafe lasers looks very promising. I believe both the US and Japan would gain a lot from this program. I think this can be used as the groundwork to broaden the scope of work and include other aspects of electro-optics research in the future.