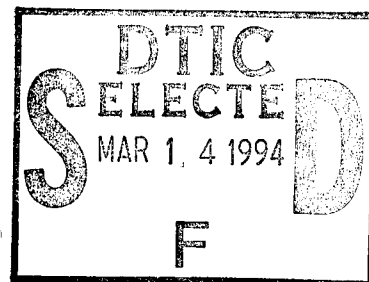


# AOARD REPORT

NEC Central Research Laboratory in Kawasaki

Apr 6 1993  
S. J. Yakura  
AOARD



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The amount of defense related work done at NEC is less than 2%.

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TOKYO, JAPAN  
UNIT 45002  
APO AP 96337-0007  
DSN: (315)229-3212  
Comm: 81-3-5410-4409

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To: Shiro Fujishiro  
From: S. Joe Yakura

Date: 7 Apr 93

CC: Rod Tanaka, MDAO  
LtCol David Crawford, MDAO

**Subject:** NEC Visit (Kawasaki, Japan), 6 Apr 93

**ABSTRACT:**

The NEC Central Research Laboratory is located in Kawasaki, Japan. There are more than 1,200 personnel working at this site, focusing their research efforts in optoelectronics.

The amount of defense related work done at NEC is less than 2%. NEC is active in the overseas technology exchange program. Currently, there are more than 30 foreign scientists working at various NEC laboratories to enrich technical exchange programs with the U.S. and European countries.

**Purpose:** Accompany Mr Bachkosky and LtCol Crawford for the NEC Central Research Laboratories visit (Kawasaki, Japan)

Time of Visit: 1000 - 1230, Tuesday, 6 Apr 93.

Participants: See Attachment 1.

**Observations/Comments:**

1. The visit to the NEC Central Research Laboratories was arranged by MDAO, US embassy as part of the US-Japan Science and Technology Forum. NEC personnel greeted us with the usual Japanese hospitality when we arrived at their research site in Kawasaki. Six managers from NEC greeted us and briefed us on NEC's R&D efforts, specifically related to their optoelectronics work. Agenda and participants are shown in Attachment 1.

2. In conversations with Mr Bachkosky inside the MDAO car, en route to NEC, Mr Bachkosky mentioned that he was disappointed with TRDI research capabilities and hoped that this NEC visit sheds better understanding of availability of advanced optoelectronics technologies in Japan. He thought TRDI is at least five years behind US defense technologies and there is nothing for the US to learn from TRDI at this point. I mentioned to him that in Japan most of the advanced research efforts were handled by the Ministry of International Trade and Industry (MITI) and there are MITI's advanced technical research laboratories located at Tsukuba City (around 1 hour drive northeast of Tokyo). I really think it is worthwhile for Mr Bachkosky to visit the Tsukuba research center to see the extent of scientific research carried out in Japan. It is a very difficult concept for American to realize that defense technology does not take the lead in basic research arena, but rather it is

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done under the umbrella of the commerce department.

3. The NEC overview was nothing more than watching NEC's PR tape. It gave good top level understanding of types of basic and applied research work done at their research laboratories. It is kind of interesting to find out there are 14 NEC facilities in the United States. Included in those 14 sites is the NEC Research Institute, Inc. at Princeton, NJ ( I believe they meant to say New Brunswick, NJ but in Japan the name "Princeton" is better understood). Additional NEC facilities are located all over the world, showing the extent of international marketing influence that NEC has in the world market.

4. At this NEC laboratories site in Kawasaki, there are 1200 people working, focusing their basic research efforts in optoelectronics. In addition, there are 400 more people working at the Tsukuba Research Laboratories on similar programs, however, more on new and advance concepts. It is very clear that NEC has established the Tsukuba Laboratories to maintain a strong tie with MITI research facilities.

5. The amount of defense related work done at NEC is less than 2%. Most of the NEC efforts is geared toward industrial market. To maintain technological edge over other competitors, NEC allocates 20-30% of the profit back into R&D. With most of their managers having technical degrees, they think in terms of a long time goal, as what we were used of in the United States before WW II. I was surprised to hear that most of NEC researchers are Master degree holders and not PhDs. There are less than 20% PhDs.

6. I asked about their company policy on the US-Japan technology exchange program with NEC. I was told that NEC is doing exactly of that. Currently there are 30 foreign scientists working at various NEC laboratories. I think we could start the Window-on-Science (or should I say the Window-on-Japan) program with them.

7. To show the level of scientists we are dealing with here at NEC, one of the participants is an IEEE editor for one of the IEEE journals. Normally that type of responsibility is reserved for professors in other part of the world; however, in Japan we could see the scientists or engineers in industry getting those honorable positions because of the level of advanced research carried out in the industrial sector.

8. I believe Mr Bochkosky got good feel for the amount of advanced research work carried in the industrial sector in Japan.