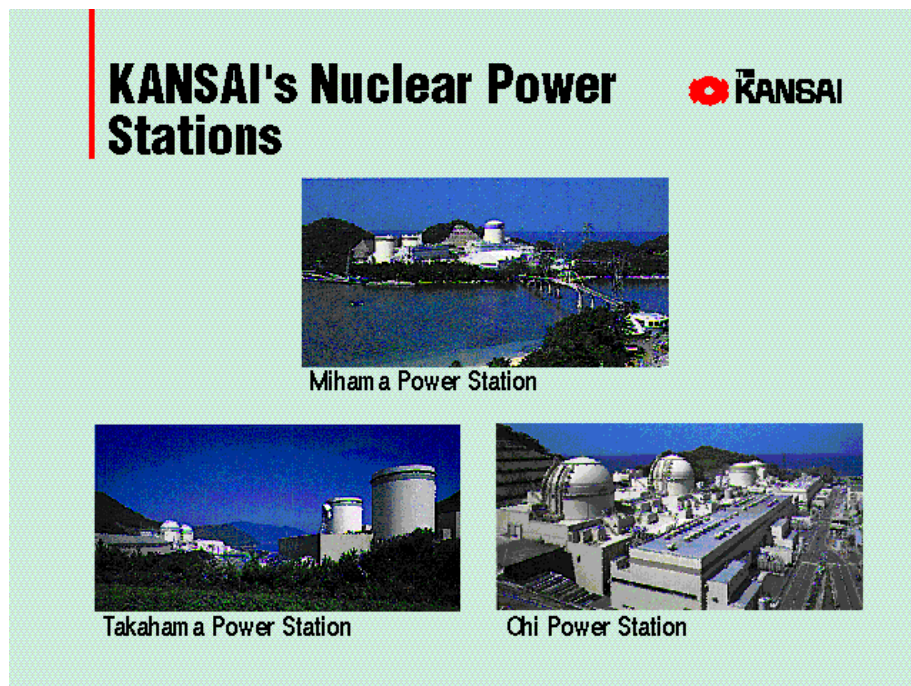


## Radiation Protection and Safety Programs in Kansai Electric Power Co., Inc.

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### Introduction

The Kansai Electric Power Co., Inc. (KANSAI) began commercial operation of Mihama Unit 1 in 1970. This was Japan's first PWR plant, and KANSAI now operates 11 PWR plants in total. (3 in Mihama, 4 in Takahama, and 4 in Ohi.)



In order to minimize the exposure dose of plant workers and the general public, KANSAI has implemented various activities based on the principle of ALARA (As Low As Reasonably Achievable).

This report summarizes the history of radiation protection and safety programs in the past 30 years in KANSAI.

### Radiation Protection and Safety

Since starting of operation of Mihama Unit 1 in 1970, we used film badges, pocket dosimeters and alarm meters to control personal exposure dose. Later, in response to the construction of power plants in Takahama and Ohi, we introduced in 1975 a radiation control system using OCR cards based on computer control, so that the personal exposure dose of workers could be centrally managed.

In 1980, to implement more thorough radiation protection and safety programs, we introduced a unique "Personal Radiation Exposure Monitoring System". This system essentially comprises an ADD (Alarming Digital Dosimeter) functioning as both pocket dosimeter and alarm meter, as well as an ADD reader that is installed at the entrance/exit of the control area to instantly check personal exposure dose.

### Reduction of Exposure Dose

Following the operating of our first nuclear plant, we experienced various problems in the 1970's and 1980's. In particular, because of troubles associated with the steam generator, the average annual dose of plant workers sometimes exceeded 3mSv/year. However, in the past several years, this similar dose has dropped to 1mSv/year or so.

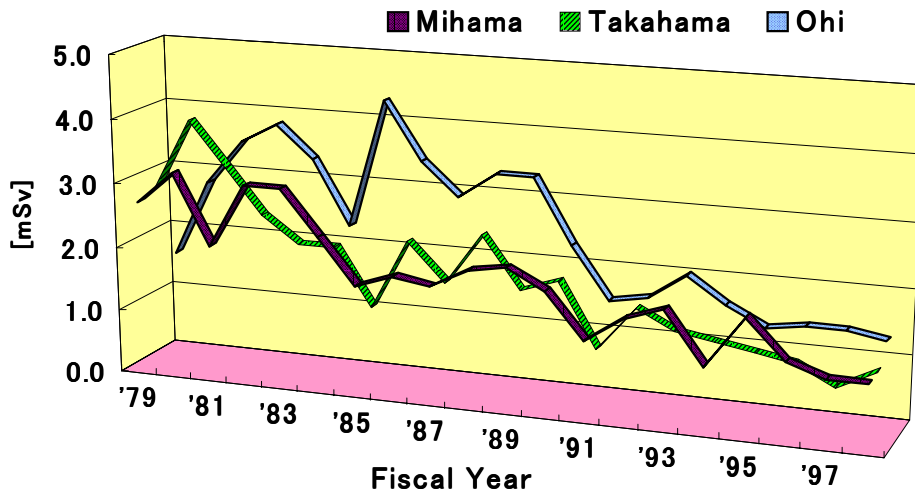


Fig.1 : Average Annual Individual Dose

This appears to result from our continued efforts to improve our nuclear facilities as well as to promote safety-consciousness among individual plant workers. In terms of renovation of nuclear power plants, the old steam generators that accounted for half the exposure dose in the 1980's were replaced with improved models to reduce frequency of repair work. And, additionally, automated and remote-control techniques were incorporated into the equipment and facilities in our nuclear power plants. In order to promote safety-consciousness among workers, we have emphasized continued exposure dose reduction programs such as dose recognition arrangement (for example, posting of ALARA signboards) and exposure prediction training at pre-operational briefings.

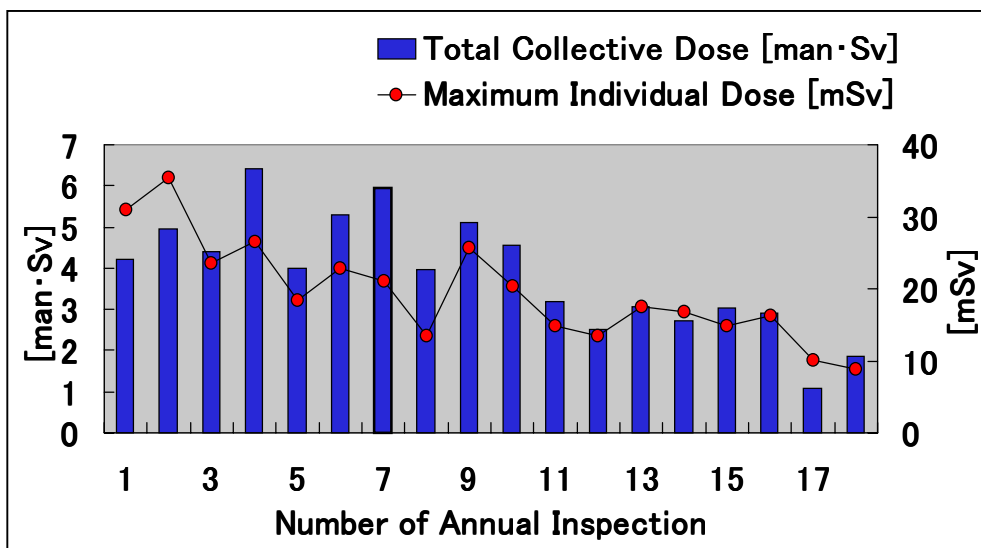


Fig.2 : Exposure Dose during Annual Inspection at Takahama-1

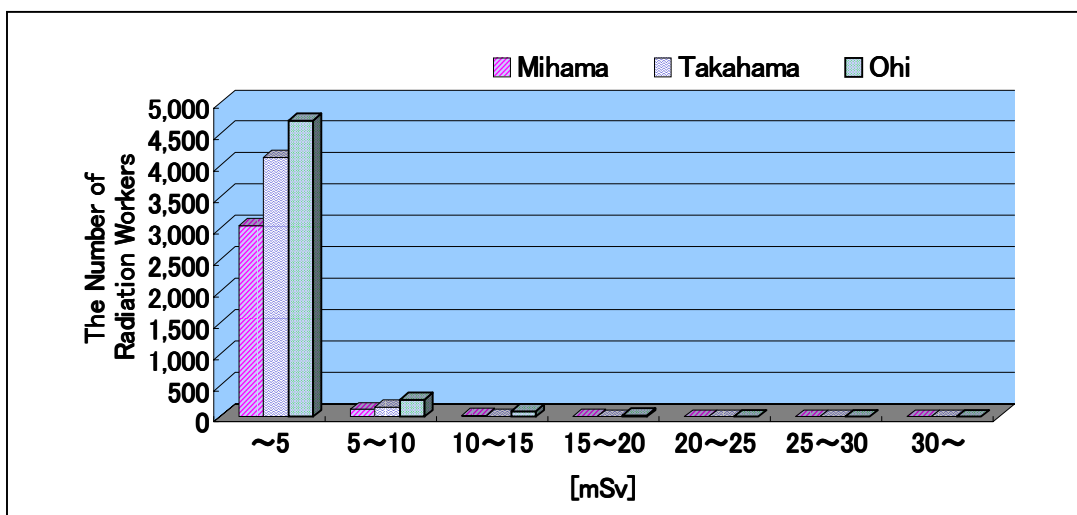


Fig.3 : Distribution of Dose (Person) in fiscal 1998

### For Better Understanding of Radiation

In order to promote for people understanding about radiation correctly, KANSAI has been sponsoring various activities, one example of which is publication of a biannual booklet titled “Life & Radiation” that was first published in 1997.

Every issue of “Life & Radiation” provides a variety of current topics in plain Japanese to readers who have certain knowledge about radiation. These topics may cover other areas such as risk management problems and biological articles rather than being solely limited to radiation.



Fig.4 : Life & Radiation

### Conclusion

KANSAI is continuing the efforts, respecting the ALARA principle, to prevent the workers and general public from being exposed to radiation unnecessarily.

And further, though it aims at the more rational radiation protection and safety program, KANSAI intends to continue the activities to minimize the exposure dose of plant workers and general public, and to promote radiation understanding of people from now on.