Utilities

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1. Introduction

In October 1997, SPring-8 opened and research began using its public beamlines. This marks a new and exciting era in the SPring-8 project's development.

SPring-8's Facility Management Department's responsibilities include the facility's Extra-High-Voltage Switchyard and -Substations, Town Gas Supply Building, Waste Water Disposal Treatment Building, Injector System Building, Linac, Synchrotron and Storage Ring [1]. The purpose of these installations, along with their dimensions and functions, are introduced in references [1] [2] [3] [4].

The department ensures the continuity of SPring-8's power supply, air-conditioning, and other utility systems, together with related monitoring systems, fire alarms, maintenance, and the management of drainage for experimental and industrial waste. Many systems administered by the department operate on a 24-hour-a-day basis throughout the year (e.g., power supplies, facility monitoring systems, and air-conditioning for the Injector System Building, Storage Ring and other buildings). The completion of a number of construction projects during 1997 added ten new buildings/facilities to the department's list of responsibilities (see Table 1).

The Facilities and Utilities Divlsion comprises four sections: Planning; Operation and Monitoring; Inspection and Maintenance; and Electric Power The Operation and Management. Monitoring Section works closely with SPring-8 subcontractors, who are steadily increasing in number as the facility's activities expand.

2. Facility Management

2.1 New Buildings and Facilities

Table 1 lists nature, function and completion dates of the 10 new buildings nd facilities added to the department's esponsibilities in 1997 [2] [3] [5]-[12], hile photographs are shown in Figure I . he department is currently responsible for O buildings and over 25 facilities.

2.2 Electricity, Water, and Town Gas

Fig. 2 shows SPring-8's monthly aximum electric power and power consumption. These average monthly values are 20.0 MW and 8,900 MWh espectively. Owing to a summer shutdown of facilities during the period July 12 until August 31, electrical power consumption figures were lower during July and August.

SPring-8's third extra-high-voltage ubstation received its license In May 1997. The supply of electric power to Hyogo refecture's "New Subaru" facility started in ecember 1997.

Fig. 3 and Fig. 4 respectively illustrate Pring-8's monthly consumption of water and town gas. SPring-8's average monthly onsumption of water is 16.6 km^3, 9.2 km^3 of which is returned as waste liquid. (The summer shutdown mentioned above led to a decrease in water consumption during July and August.) SPring-8 began receiving its supply of town gas in January and consumption increased steadily from May with the start of continuous air-conditioning in the Storage Ring. Town gas supplies were subsequentiy extended to the Cafeteria, the Structural Biology R&D Facility and Guest House.

2. 3 Operation & Monitoring

Table 2 shows that, with the exception of the Structural Biology Facility, SPring-8 as entrusted responsibility for all of its tllities to the Facilities and Utilities Division.

The division became responsible for the

10 new buildings/facilities, mentioned earlier, in October 1997. During 1997, the number subcontracting firms working on SPring-8 utilities increased from 36 in March, to 46 in September and reached 57 in October. Notwithstanding the associated increase in organizational complexity, work continued to progress smoothly.

2.4 Inspection & Maintenance

Exhausive inspections and comprehensive maintenance procedures are a vital part of measures to guarantee safety at SPring-8. The summer shutdown represented an especially intensive period of inspections and maintenance.

2. 5 Other Activities and Topics

It is important to have clear rules to ensure the safe disposal of chemicals and other industrial waste materials arising from research activities. The department has paid careful attention to studies of:

- waste management policy;
-standardization of procedures for the storage collection and disposal of waste;
- waste treatment methods.

The results will be incorporated in JASRI's official regulations.

Meanwhile the studies have revealed a simple method for elimination of heavy metals. Fig. 5 shows a case of cadmium and zinc treated with a liquid capturing agent.

References

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[3] Seinojo TAKANO and Kazuyoshi OHSHIMA, SPring-8 Annual Report, p82-89(1995)

[4] Seinojo TAKANO and Kazuyoshi OHSHIMA, SPring-8 Annual Report, p70-74(1994)

[5] Takayuki KITAMI, SPring-8 Information, p7-12, Vol.2 No.5 Sep.(1997)

[6] JASRI General Affairs Department, SPring-8 Infonnation, p13-15, Vol.2 No.5 Sep.(1997)

[7] Takayuki KITAMAI, SPring-8 Inforamtion, p8-10, Vol.1 No.5 Nov.(1996)

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[10] Kenichi SAKURAI, SPring-8 Information, p7-10, Vol.2 No.3, May(1997)

[11] JAERI-RIKEN SPring-8 Project Team Planning Group, SPring-8 Infonnation, p2-17, Vol.1 N.2 May(1996)

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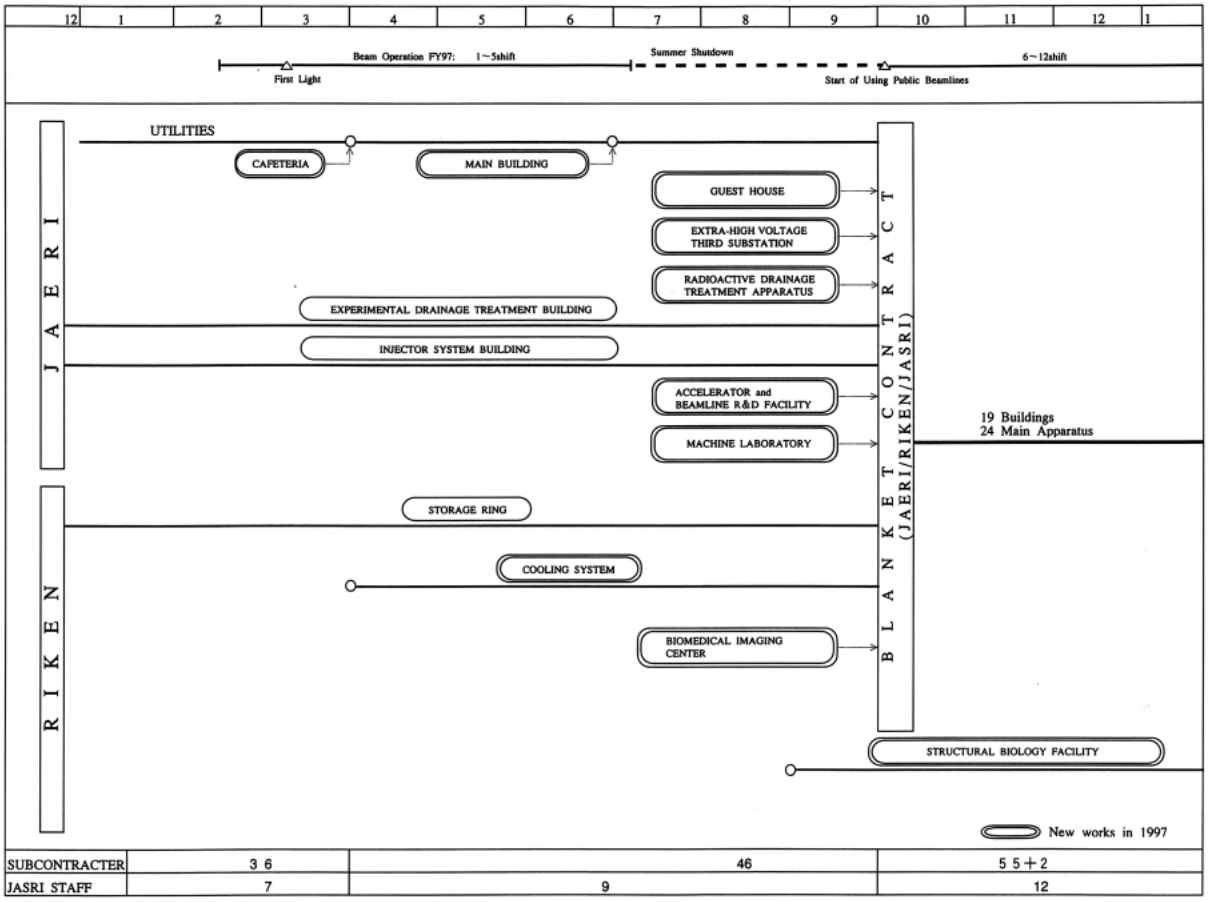
Table 1 New buildings and facilities added to the Facilities and Utilities Division's responsibilities in 1997

ITEMS	PURPOSE & REMARKS	START TIME	Ref.
CAFETERIA	one of the buildings for health and welfare management, designed to be utillized by 300 people from JAERI, RIKEN, andJASRI, 300 radiation users, and 100 outside constructors	March	[2] [3] [5] [6]
STORAGE RING FACILITIES COOLING SYSTEM	the cooling water control system for magnets,front ends,vacuum system,and klystrons in the SPring-8 Storage Ring to keep the water temperature at 30 ℃ ±1 ℃	April	
MAIN BUILDING	a core facility to support general administration,the researchers' lodge,and radiation utilization, the building accommodates a total of 300 staff,consisting of 150 from clerical and technical sections and 150 from the research sections	July	[3] [5] [7]
GUEST HOUSE (B, C, D, GUEST HOUSE RECEPTION)	the main function of the guest houses is to serve as waiting rooms for outside radiation researchers during short-time stays for research , 240 roomes including A house are to be provided based on the assumption of 300 radiation researchers	October	[3] [6] [8]
MACHINE LABORATORY	the laboratory consist of the main assembly room and the data processing room for production and establishment of acclerators to promote upgrading and R&D of acclerator science	October	[3] [9]
ACCELERATOR and BEAMLINE R&D FACILITY	the building consist of the assemly experiment room and the precise adjustment experiment room to compensate for the shortage of space and rooms with stable air conditionning of the machine laboratory	October	[3] [9]
EXTRA-HIGH VOLTAGE THIRD SUBSTATION	transforms the power to 6.6kV by transformers(6MVA,2units) to supply it to the machine laboratory,the assemly&ajustment experimental building,and the structural biology R&D facility	October	[3]
RI LABORATORY RADIOACTIVE DRAINAGE TREATMENT APPARATUS	apparatus for treatment of radioactive drainage using cement solidification method in the RI Laboratory which conducts research using radioactive isotopes	October	[10]
BIOMEDICAL IMAGING CENTER	facility for imaging technology research and development related to the diagnosis of cancer,heart disease and other biomedical applications	October	[2] [11]
STRUCTURAL BIOLOGY FACILITY (RIKEN)	facility for research into the structure and function of large biomolecules	Septem ber	[12]

Table 2 Buildings and facilities entrusted responsibility to the Facilities and Utilities Division in 1997



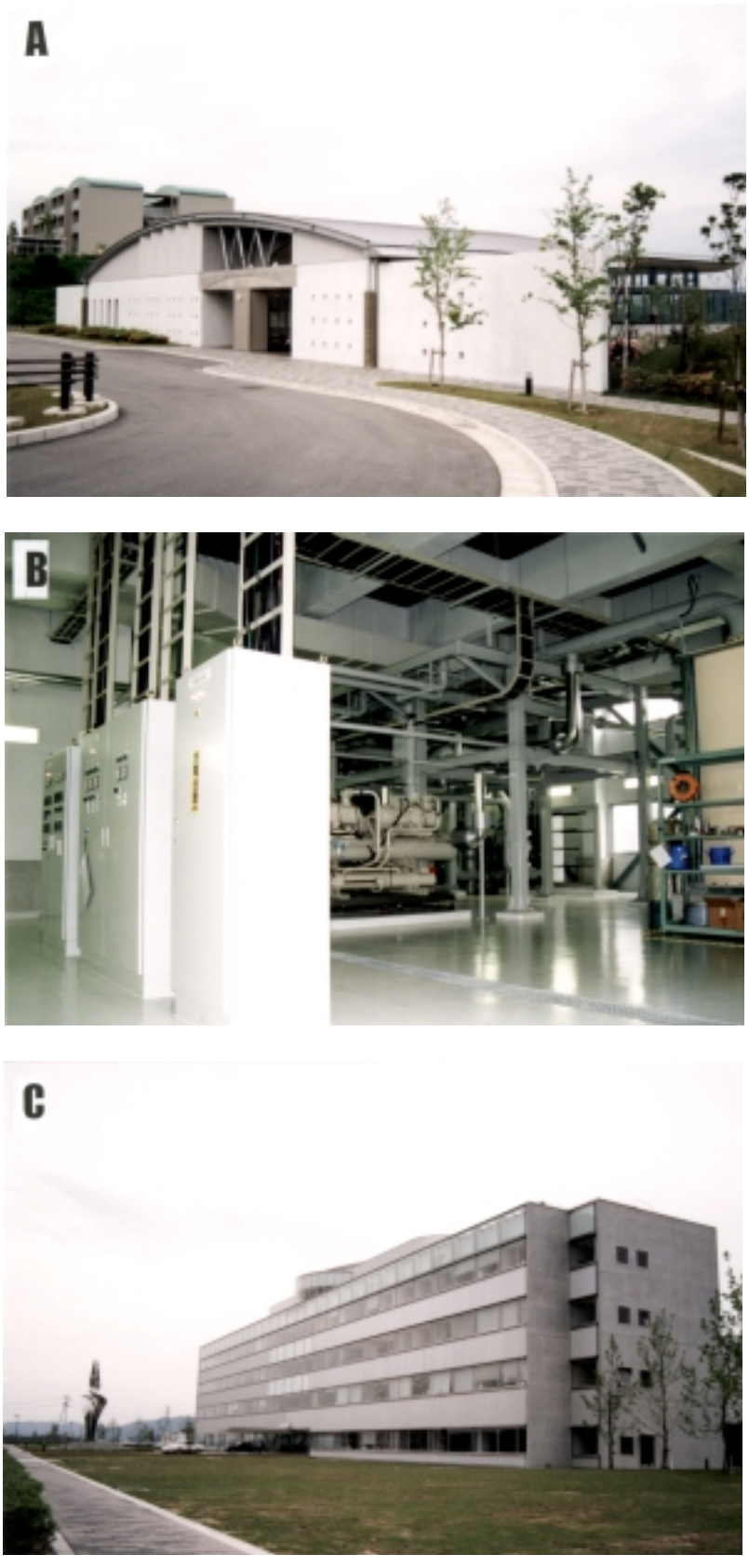


Fig. 1-1 Outward appearances of the new buildings and apparatus in 1997

A:Cafeteria

B:Storage Ring Facility Cooling System

C:Main Building

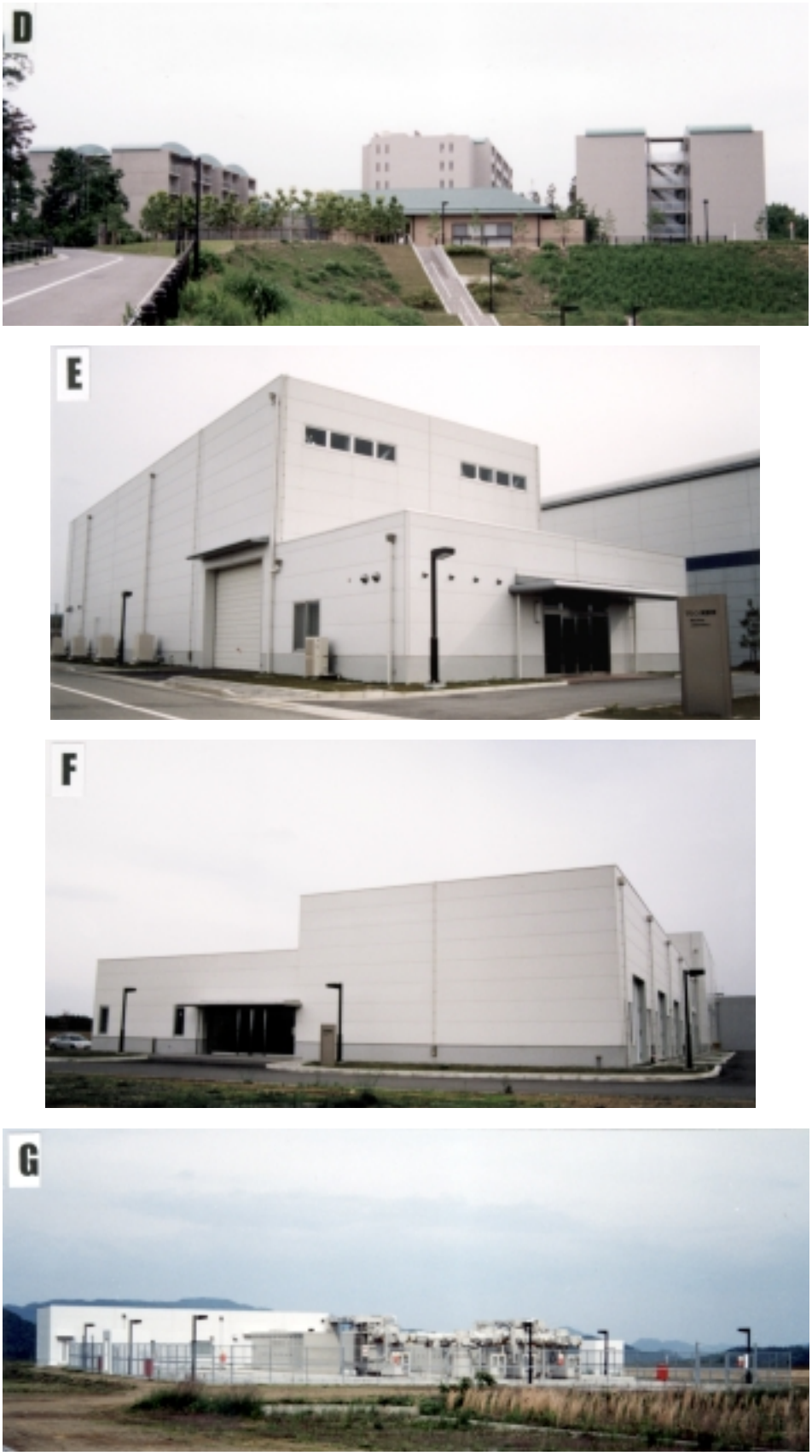


Fig. 1-2 Outward appearances of the new buildings and apparatus in 1997
D:Guest House F:Acclerator and Beamline R&D Facilities
E:Machine Laboratory Extra-High Voltafe Third Substation

Fig. 1-3 Outward appearances of the new buildings and apparatus in 1997

H: Radiactive Drainage Treatment Apparatus

I: Biomedical Imaging Center

J: Main Building

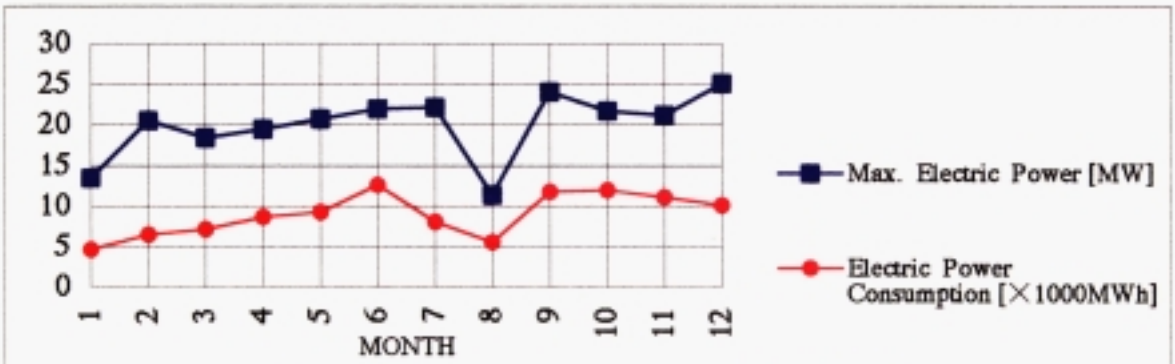


Fig.2 The electric power consumption in 1997

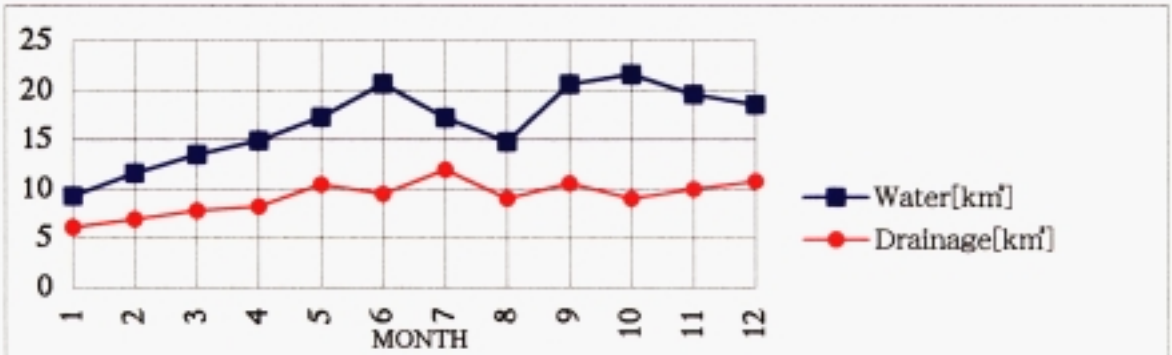


Fig.3 The water consumption in 1997

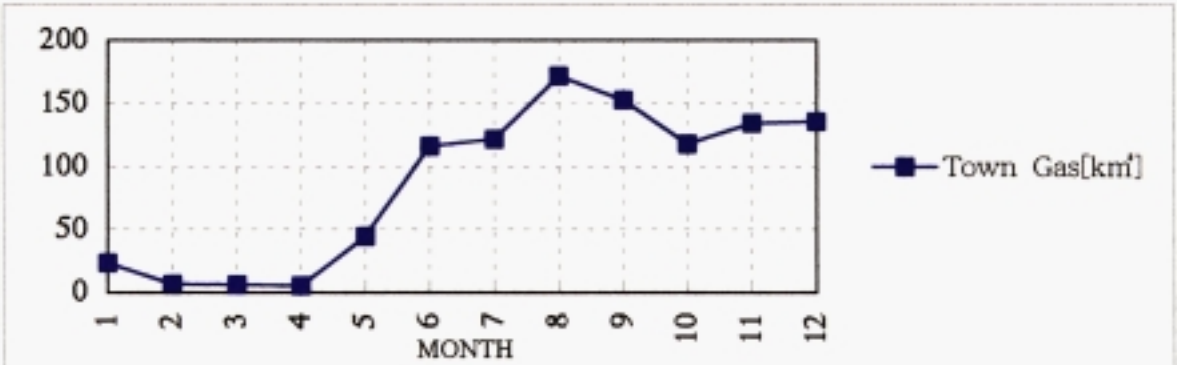


Fig.4 The town gas consumption in 1997

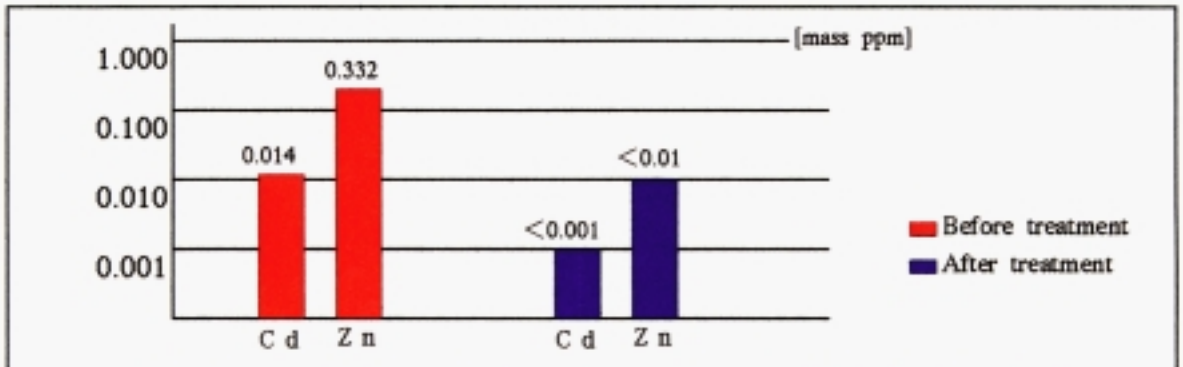


Fig.5 An example of elimination of heavy metals treated with liquid capturing agent