

TEPCO's Challenges for Occupational Exposure Reduction

-Installation of Additional CF in Fukushima Daiichi NPP-

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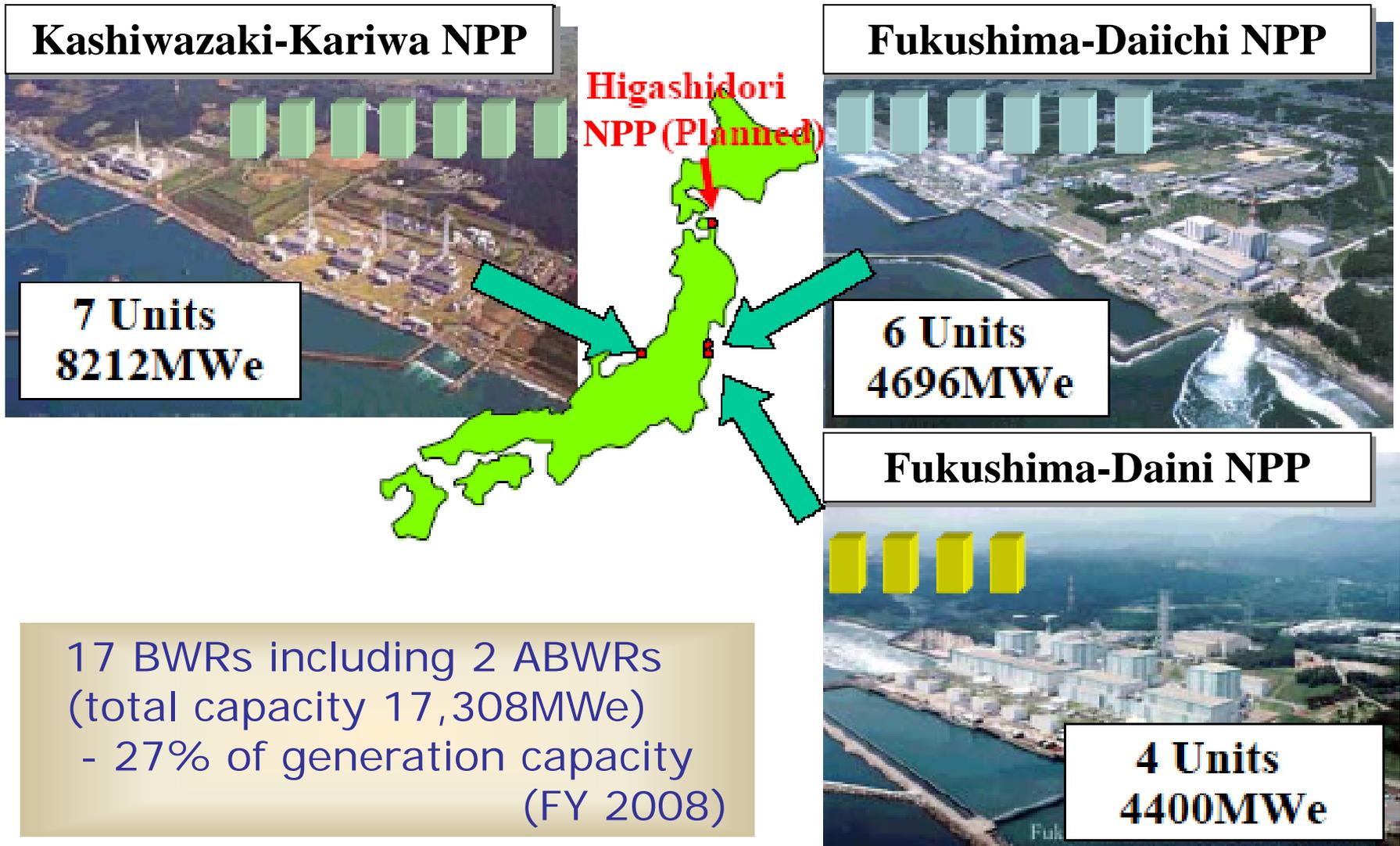
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TOKYO ELECTRIC POWER COMPANY

TEPCO's Nuclear Power Plants



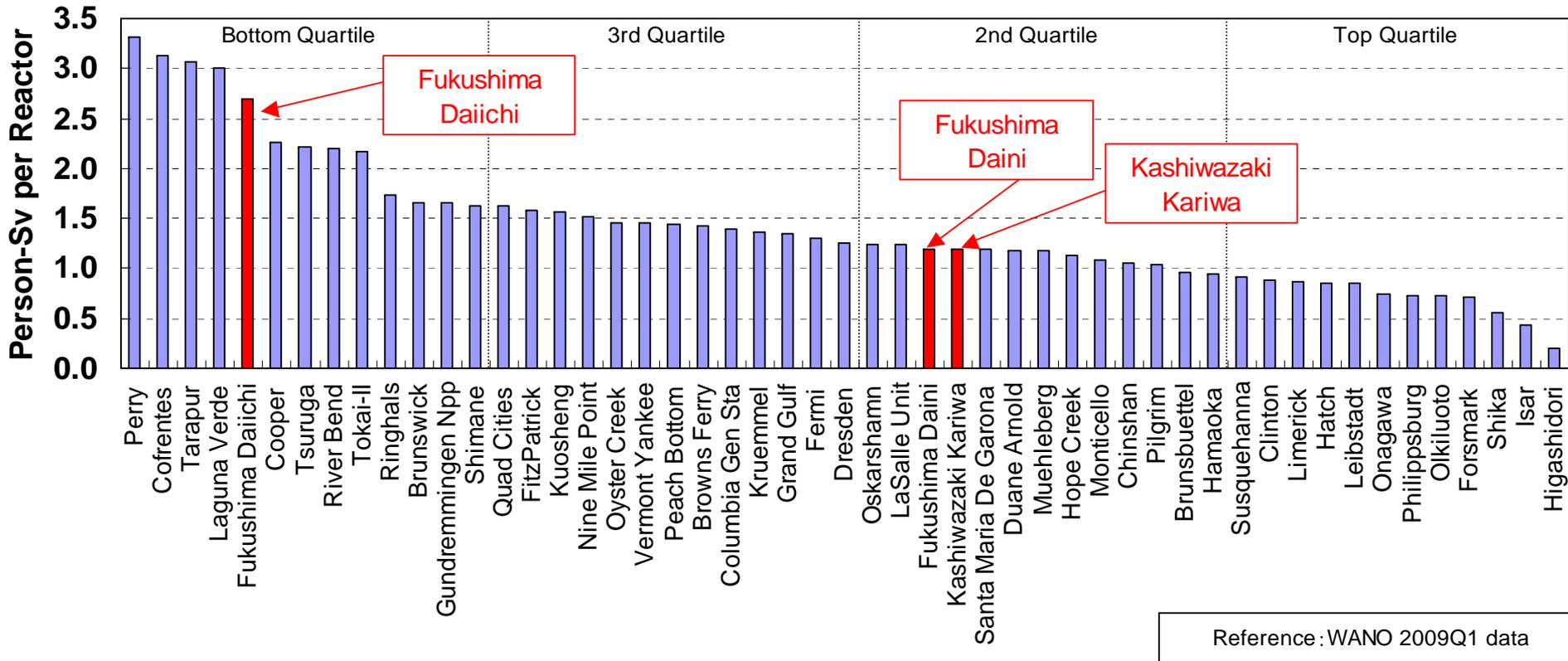
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- ⊕ Occupational Exposure in NPP
- ⊕ Measures for Reduction of Collective Dose
- ⊕ Quality of Feed Water after Installation of Additional CF in Fukushima Daiichi Unit 6
- ⊕ Collective Dose Estimation
- ⊕ Secondary Effects by Reduction of CRUD
- ⊕ Conclusions

Occupational Exposure in NPP (1/2)

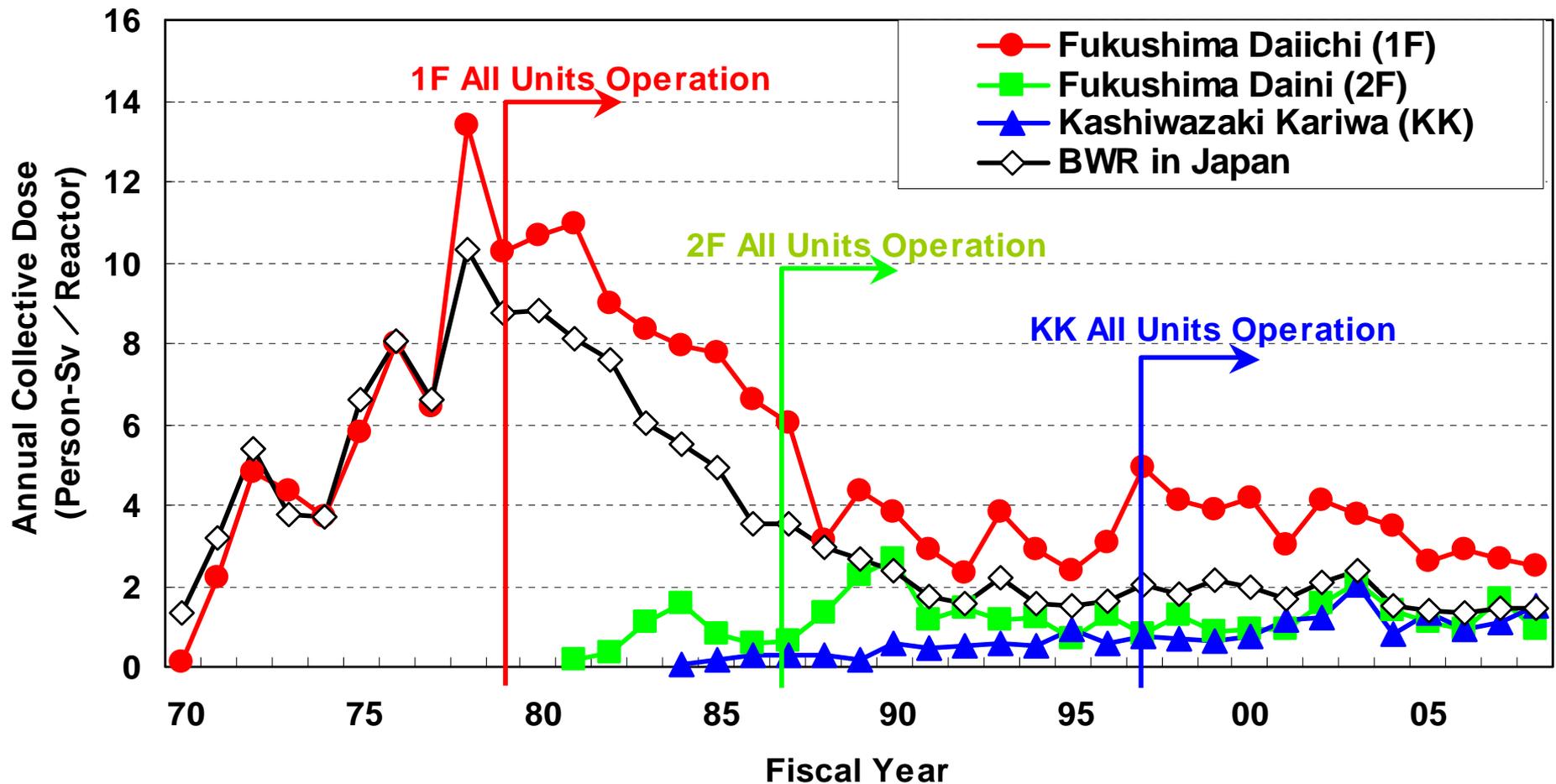
Collective Dose per Reactor in Nuclear Power Station (BWR)

(2006 to 2008 Average)



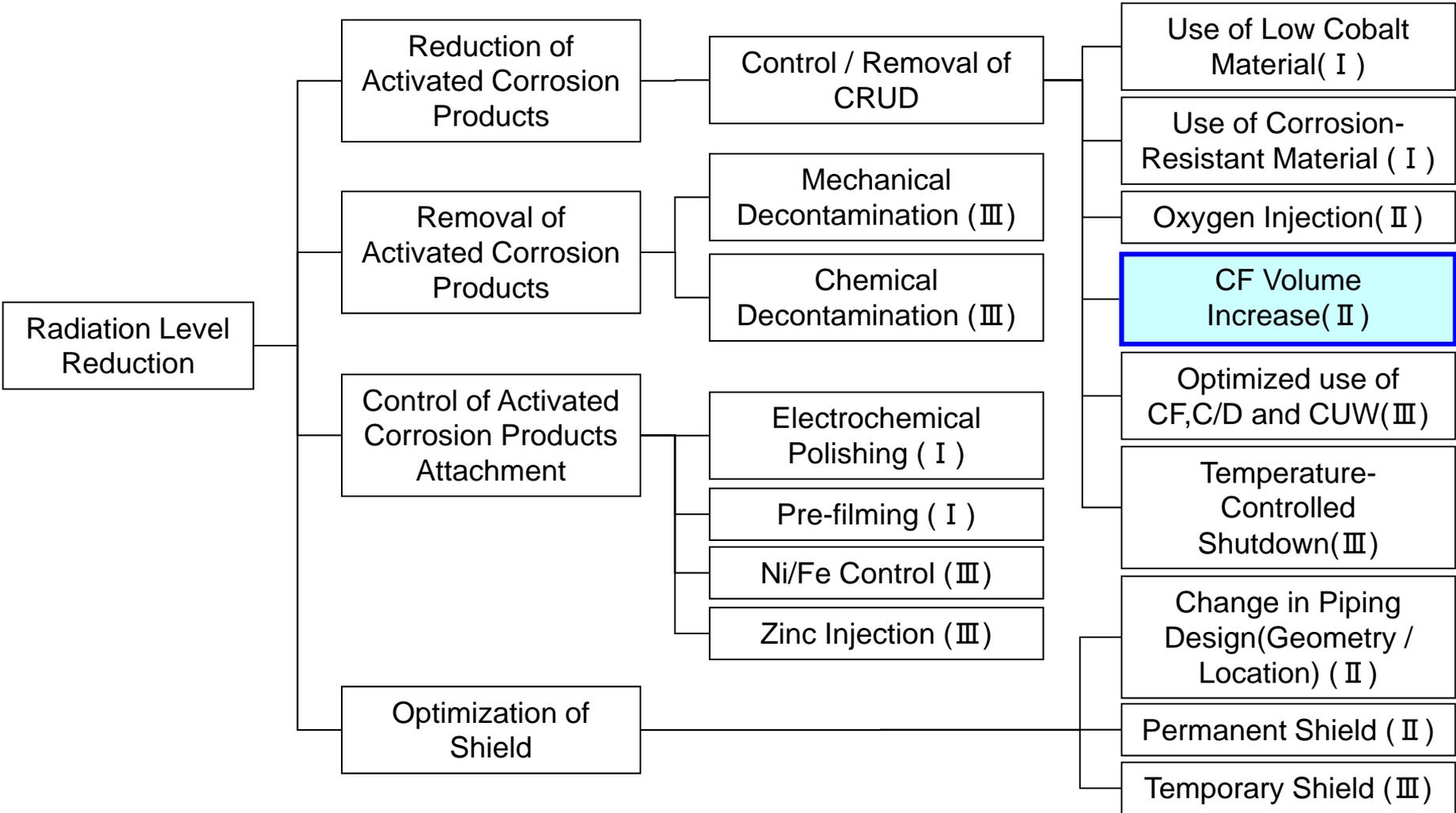
Occupational Exposure in NPP (2/2)

Annual Collective Dose Trend per Plant in Japan



Measures for Reduction of Collective Dose(1/4)

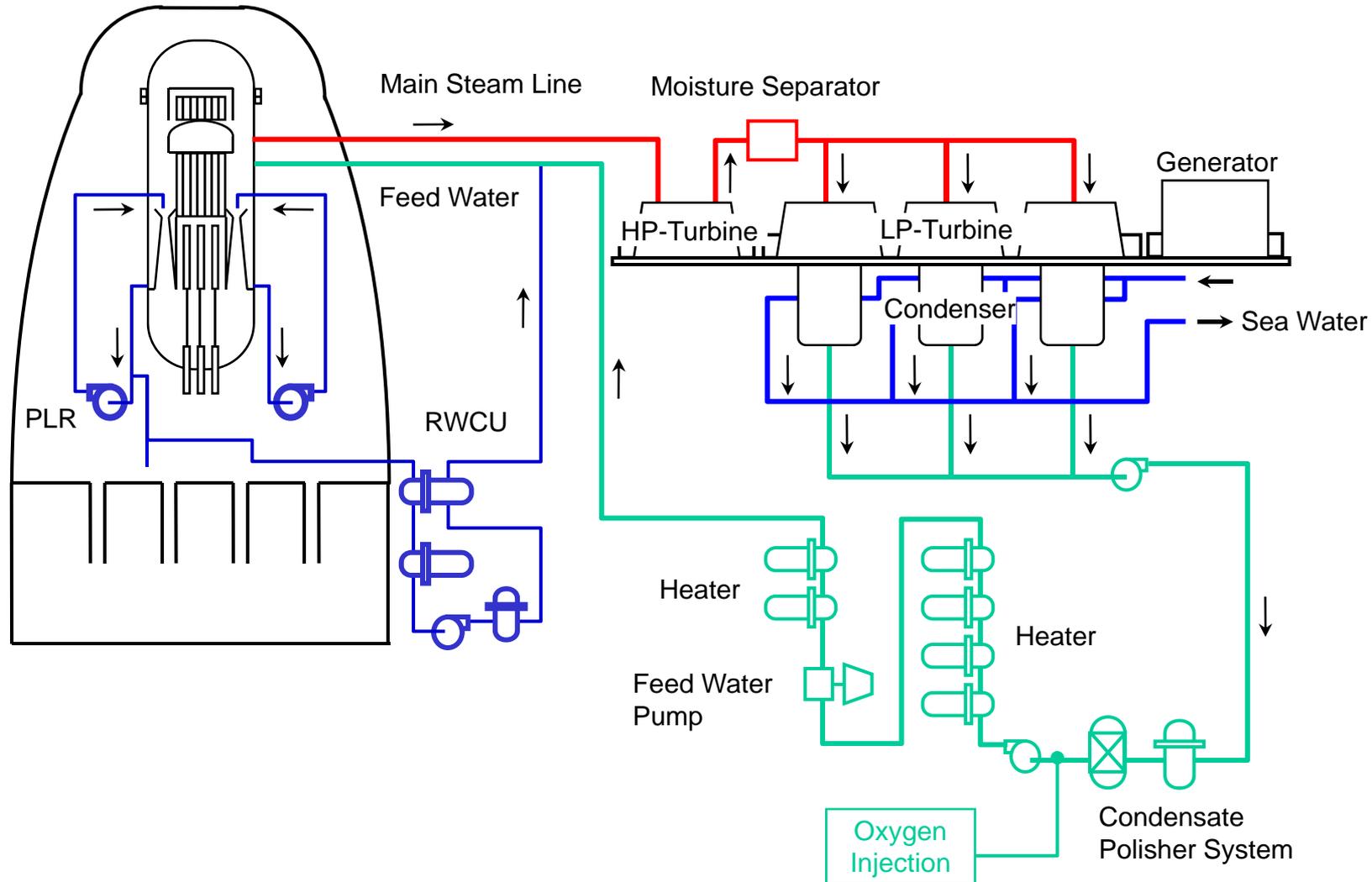
Measures for Reduction of Collective Dose in PCV



Improvement of (I) Material (II) Equipment or System (III) Operation

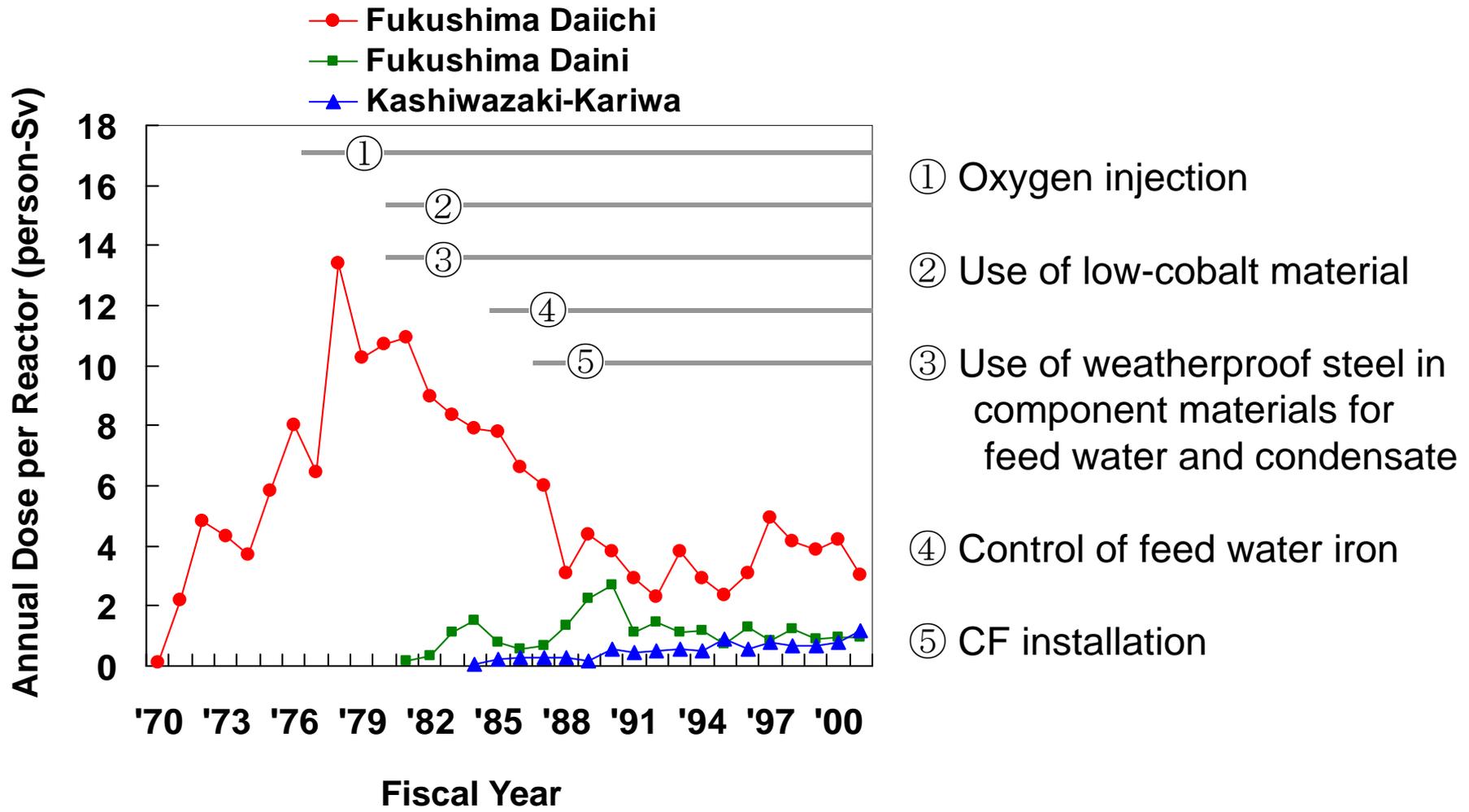
Measures for Reduction of Collective Dose(2/4)

Reactor Primary System (BWR)



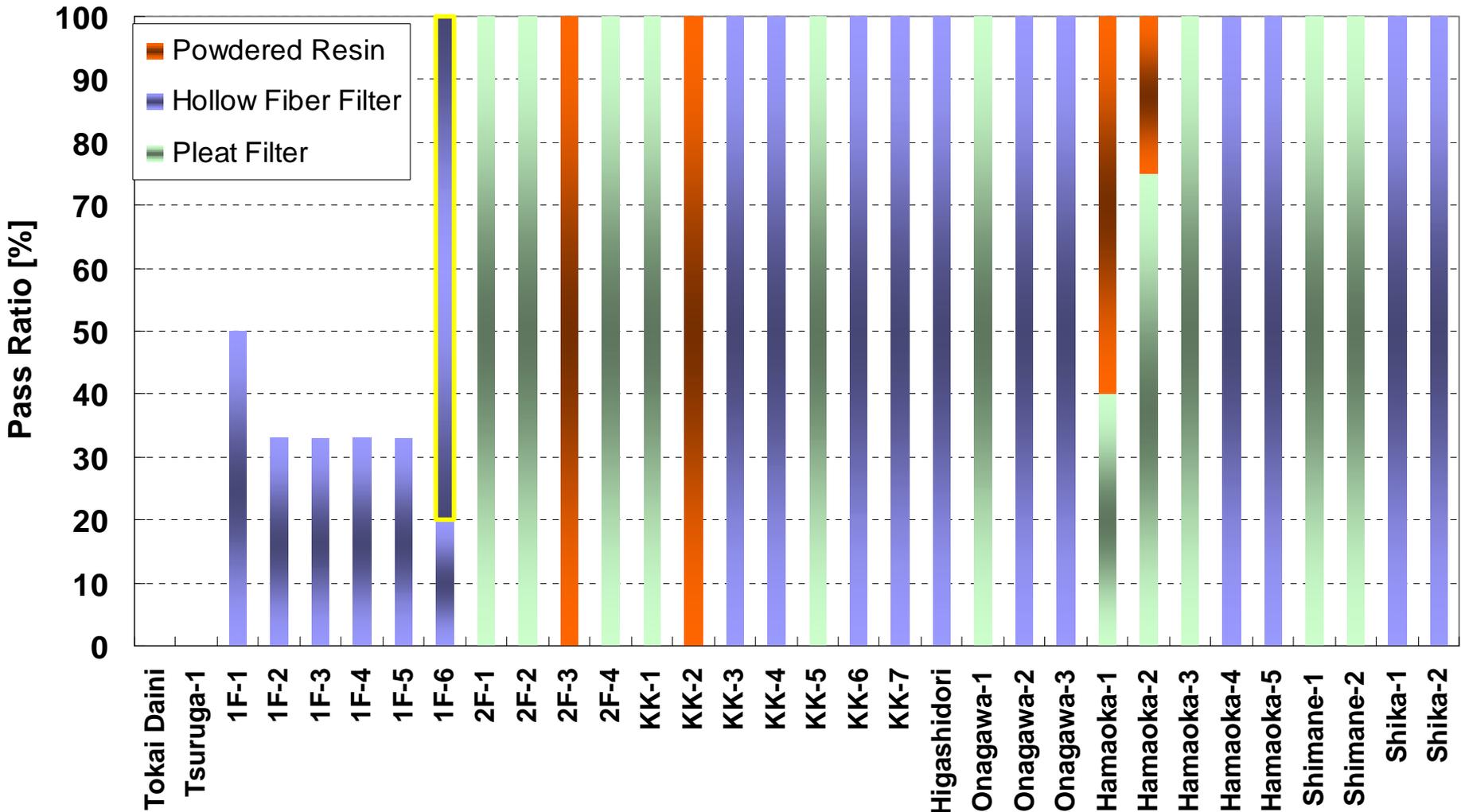
Measures for Reduction of Collective Dose(3/4)

Results of Dose Reduction Measures



Measures for Reduction of Collective Dose(4/4)

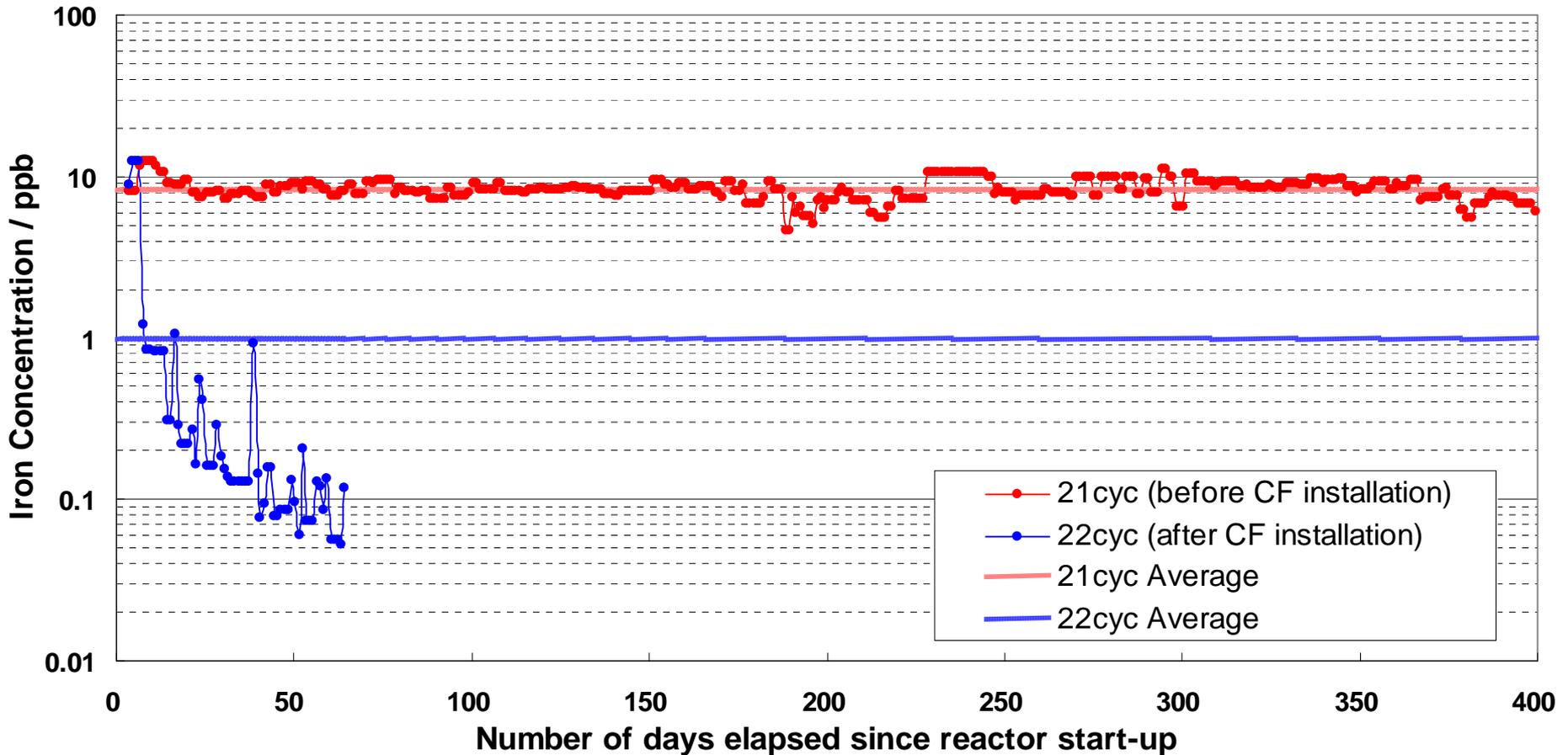
CF(Condensate Pre-Filter) in Japan (BWR)



Quality of Feed Water

Feed Water Iron Concentration Trend after CF Installation

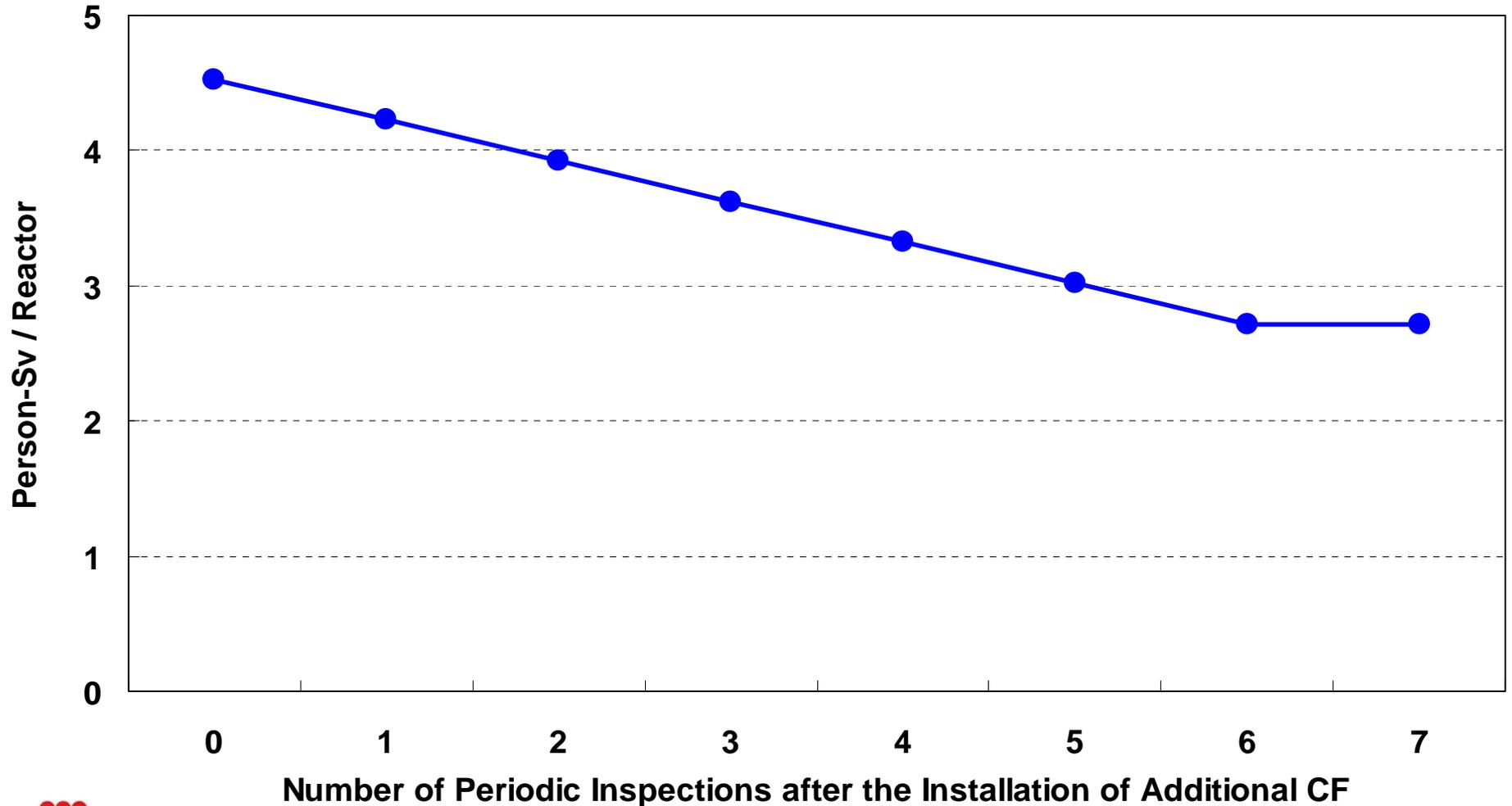
(Fukushima Daiichi Unit 6)



Collective Dose Estimation

Collective Dose Estimation after additional CF Installation

(Fukushima Daiichi Unit 6)



Secondary Effects by Reduction of CRUD

Object	Effect	Cost Saving Object
Jet Pump	Efficiency Improvement	Electricity Cost
	Less Frequency of Cleaning	Cleaning Cost
C/D Resin	Life Extension	Replacement Cost
	Less Frequency of <ul style="list-style-type: none"> ▪ Backwashing ▪ Regeneration 	Decommissioning Cost
		Water Treatment Cost Chemical Treatment Cost
Shutdown	Faster Drop in Temperature	High Operating Ratio

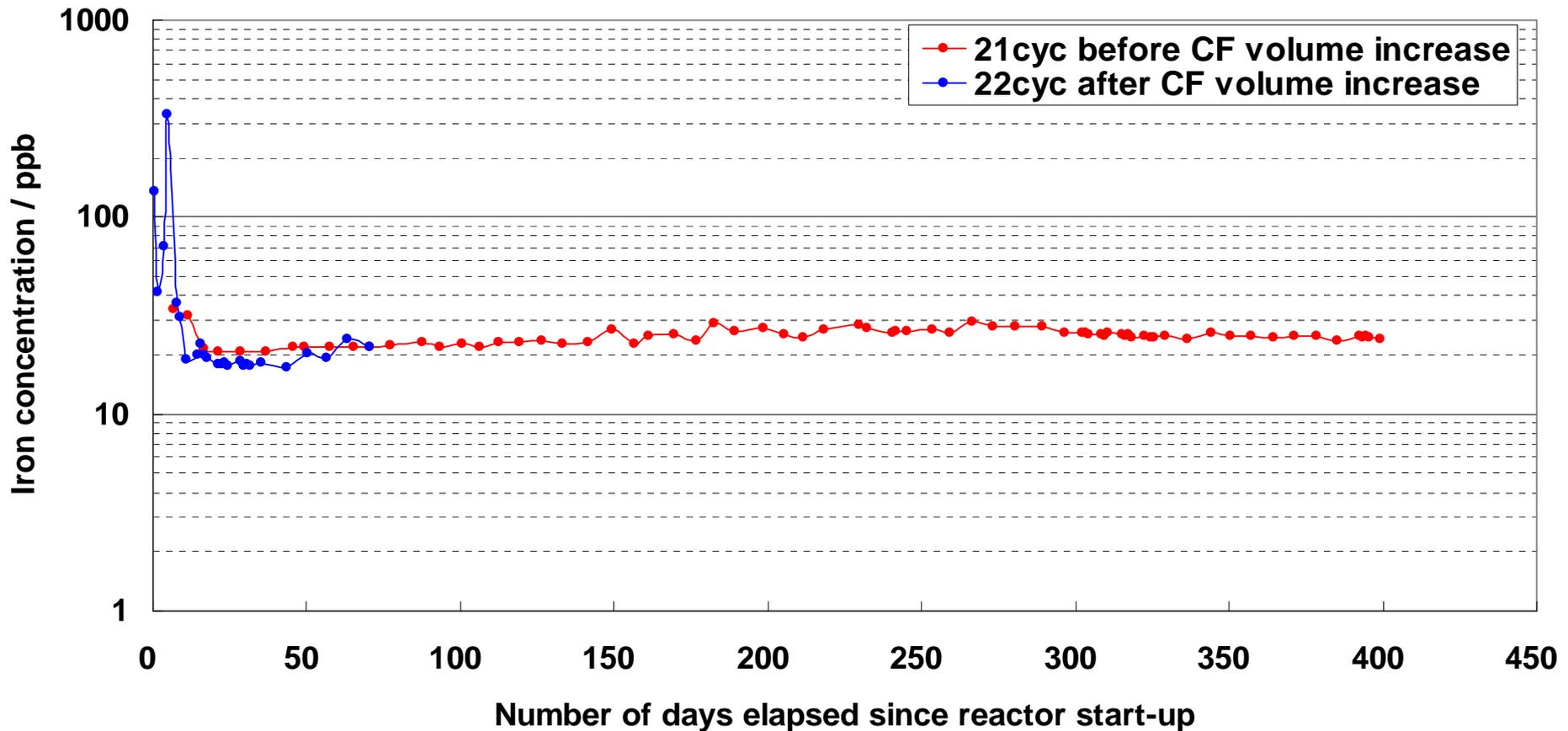
Conclusions

- ⊕ We have successfully reduced the concentration of feed water iron in Fukushima Daiichi Unit 6 by the installation of additional CF.
- ⊕ We'll continue to try to reduce occupational exposures by every possible measures after cost performance evaluations.

Support Documentation(1/5)

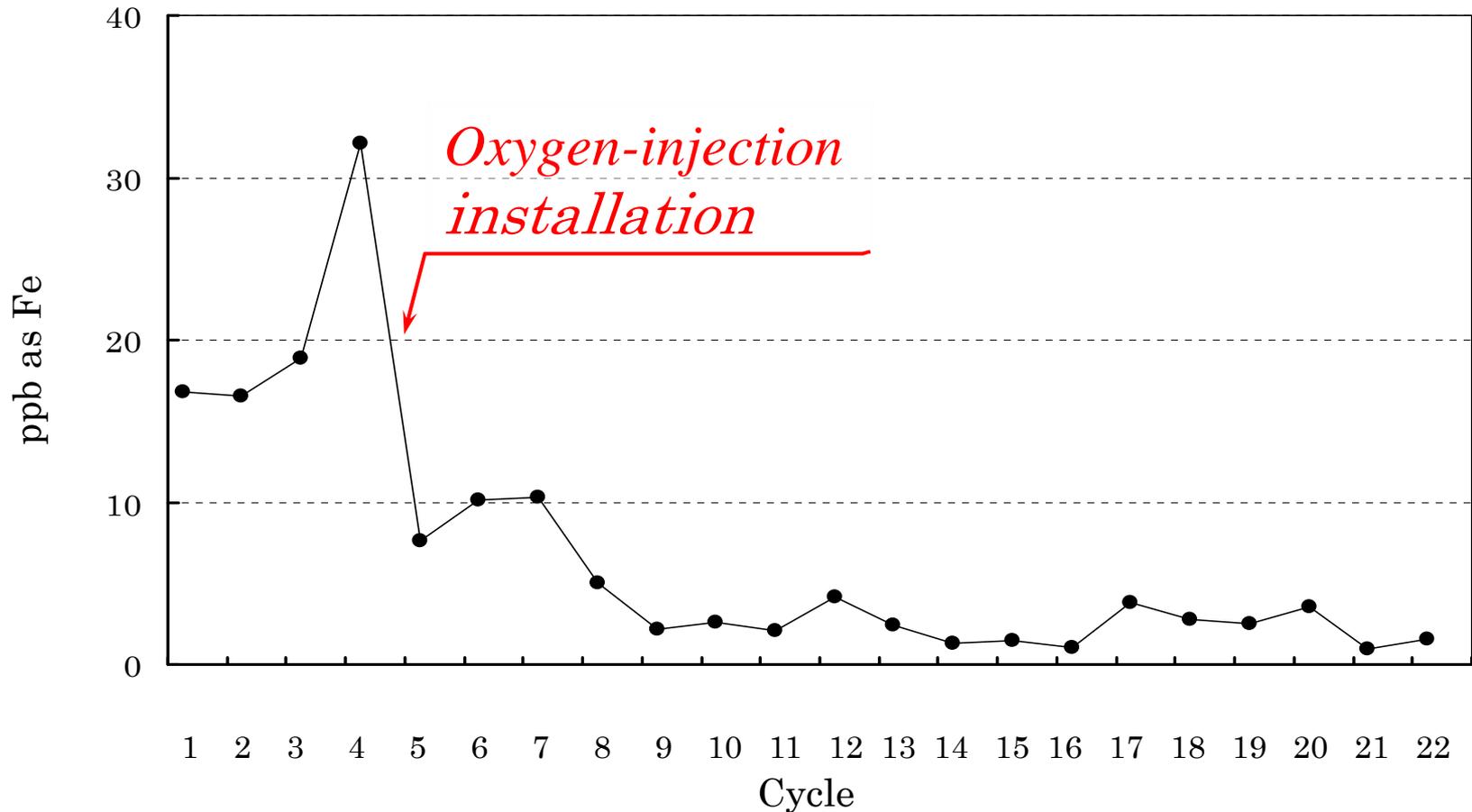
LPCP-out Iron Concentration Trend after CF Volume Increase

(Fukushima Daiichi Unit 6)



Support Documentation(2/5)

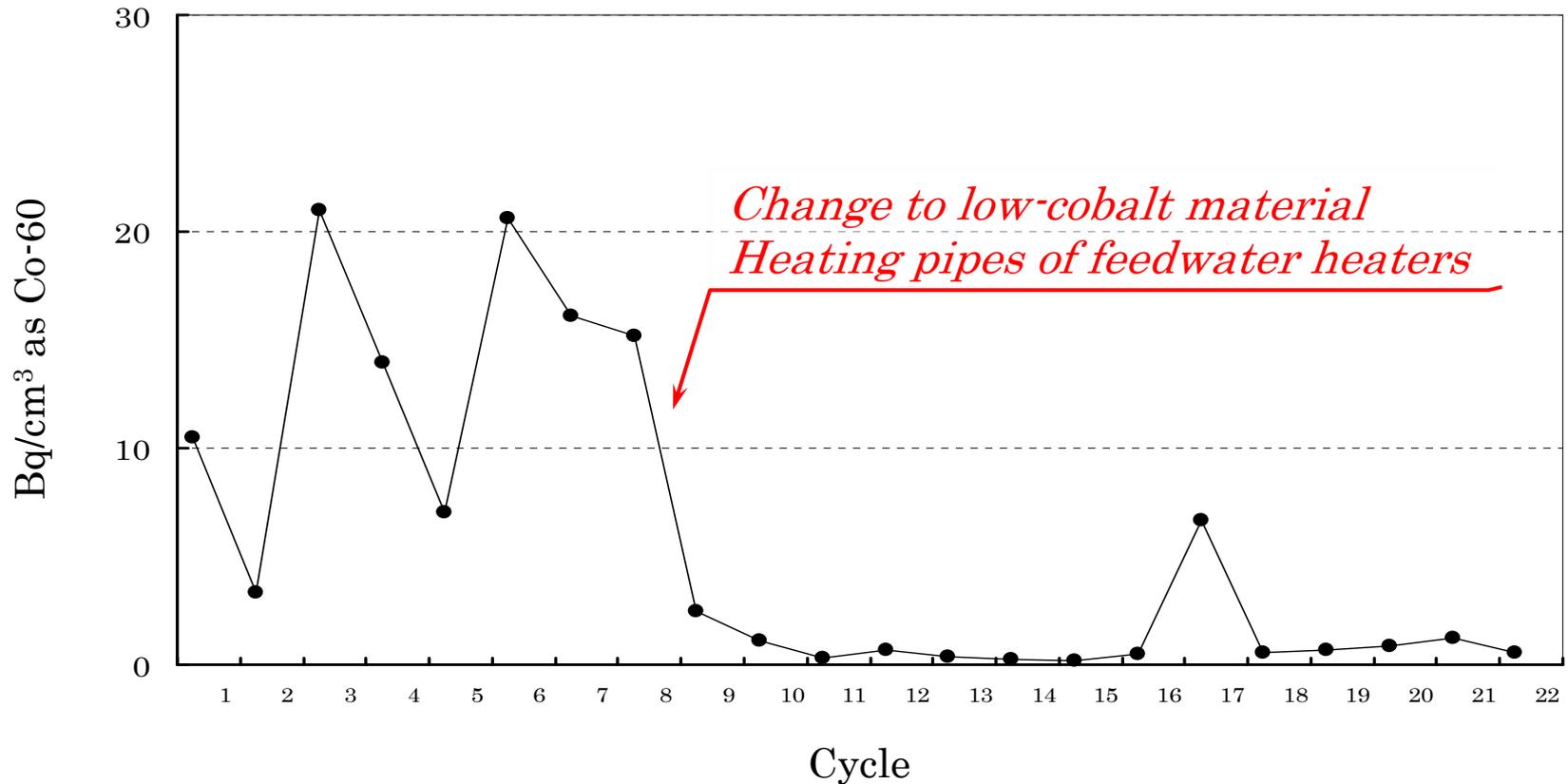
Injecting Oxygen Into the Feed Water System (Fukushima Daiichi Unit 1)



The concentration of the insoluble iron in the feedwater.

Support Documentation(3/5)

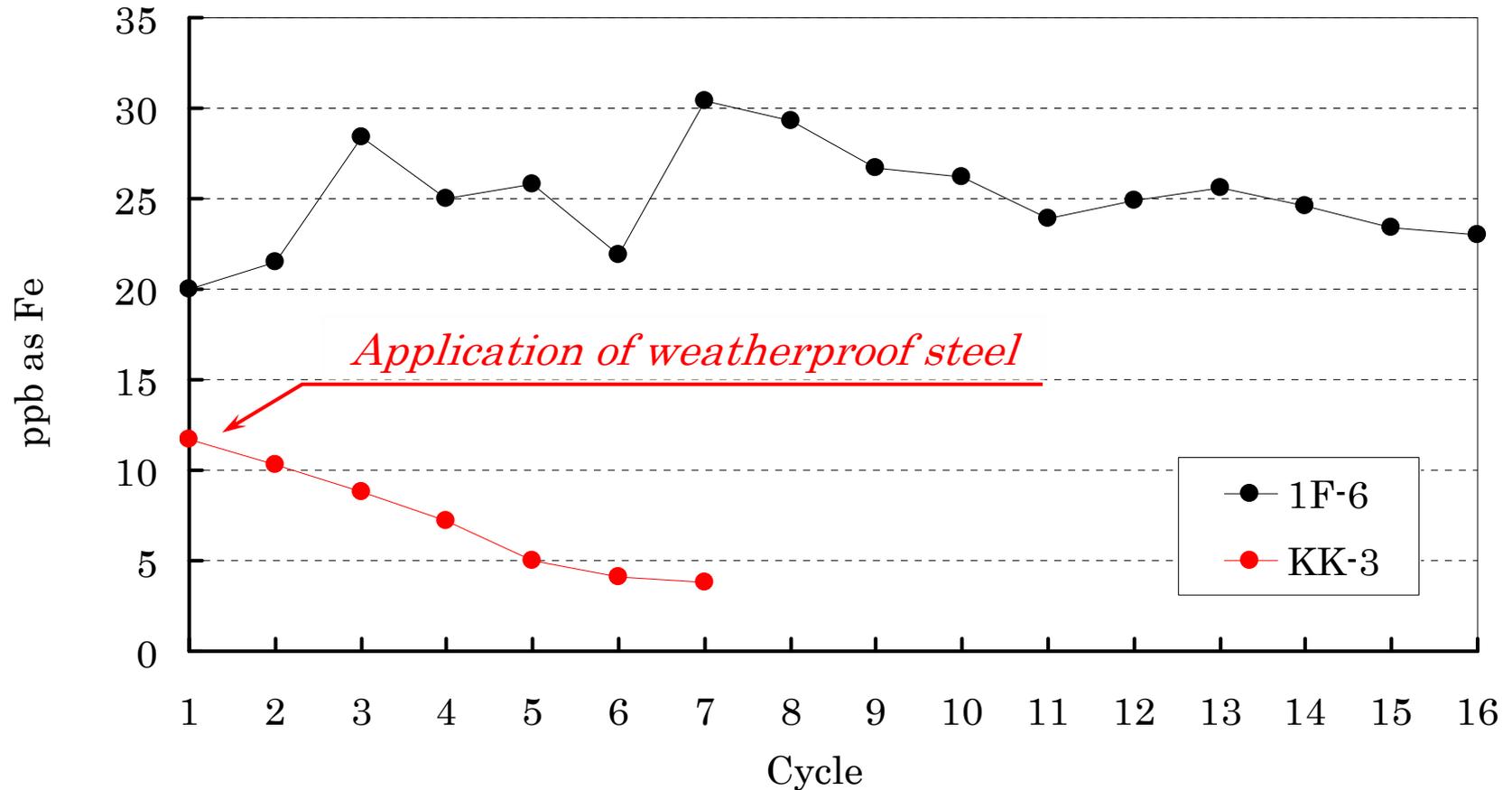
Use of Low Cobalt Material (Fukushima Daiichi Unit 1)



The concentration of Co-60 in the reactor water.

Support Documentation(4/5)

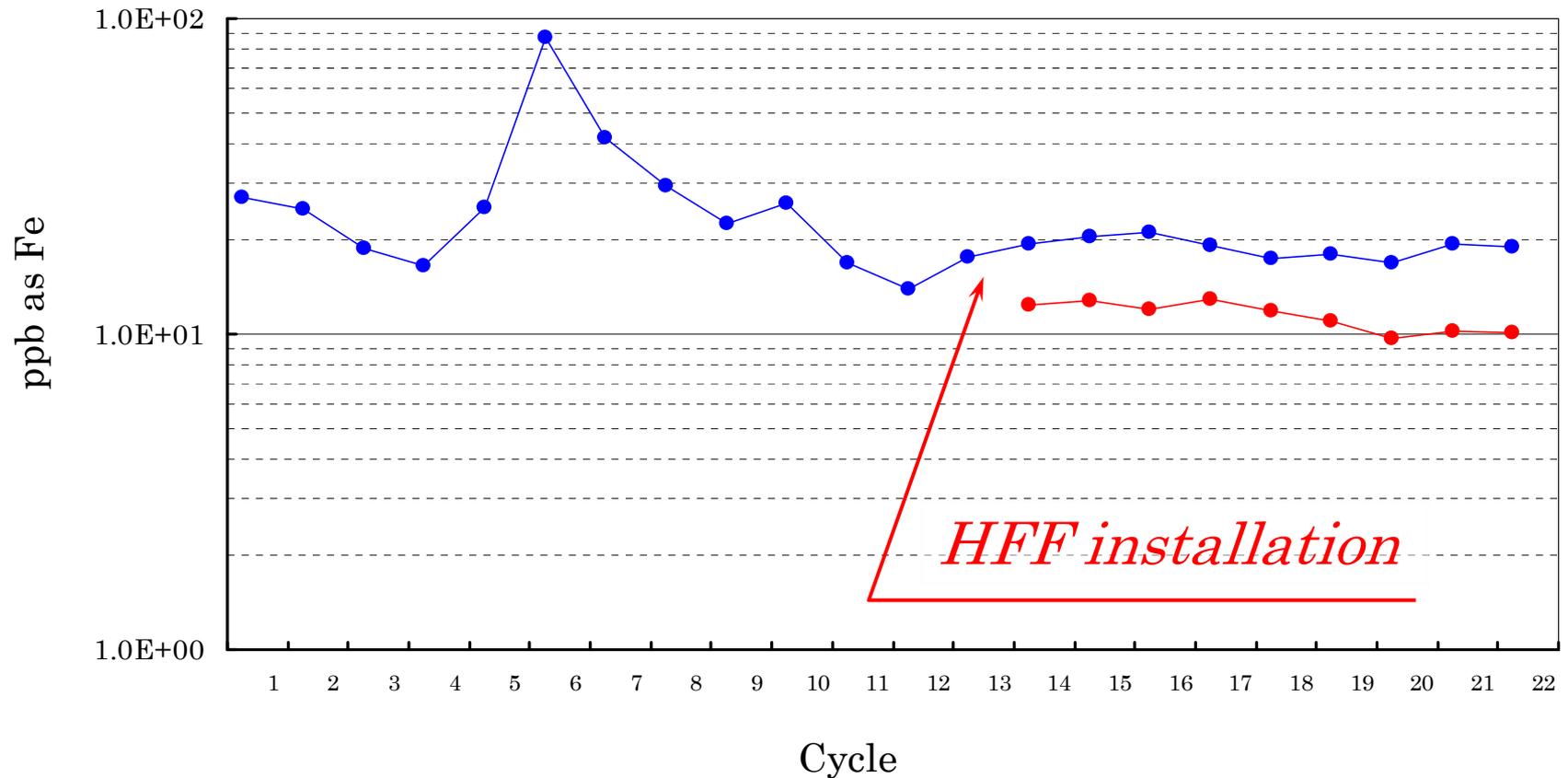
Use of weatherproof steel



The concentration of the insoluble iron in the condensate water

Support Documentation(5/5)

Duplication of condensate purification system
(Fukushima Daiichi Unit 1)



The concentration of the insoluble iron in the condensate water

Measures for Reduction of Collective Dose(2/4)

Reactor Primary System (BWR)

