

Using of Wireless Communication in Nuclear Power Plants.

19

222- 13

3 PPS, PCS, CPC

Abstract

The using of wireless communication in nuclear power plants have been limited due to the mis-operation of the safety related instrumentation and control system. If some obstacles such as electromagnetic interference are solved, the using of wireless communication in nuclear power plants recommended because of lots of benefit. In this paper, we measured the electric field intensity for the operation of a portable transceiver in the area of the PPS, PCS, CPC and main control room and provided the electric field intensity limits that a portable transceiver can be used safely near by the safety related systems without electromagnetic interference to the safety related equipment.

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2.

1)

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Paging Channel 가

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Paging

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Paging

2)

-

Paging

가

-

가 가

-

가

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Paging

가

-

가

3.

3

PPS, PCS, CPC

4.8 W,

220MHz

가

PCS

PCS

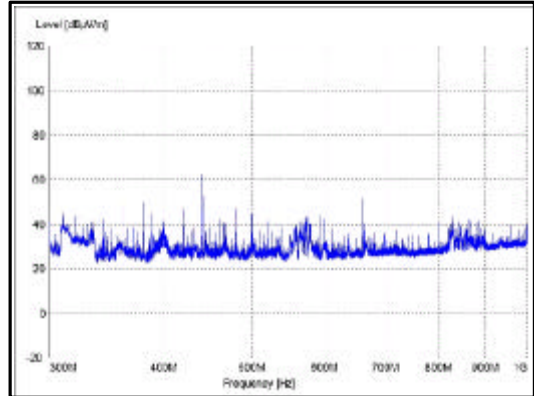
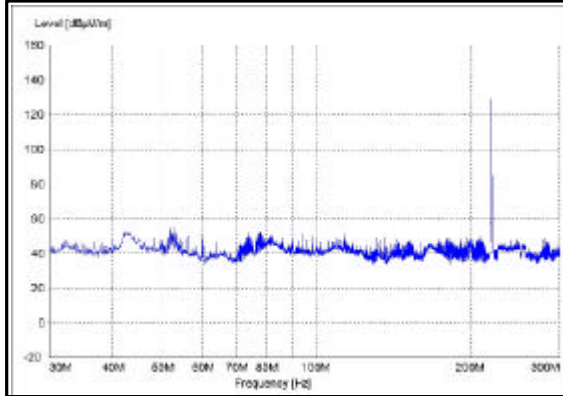
PCS가

PCS가

PCS가 , CPC PPS
 PPS, PCS, CPC

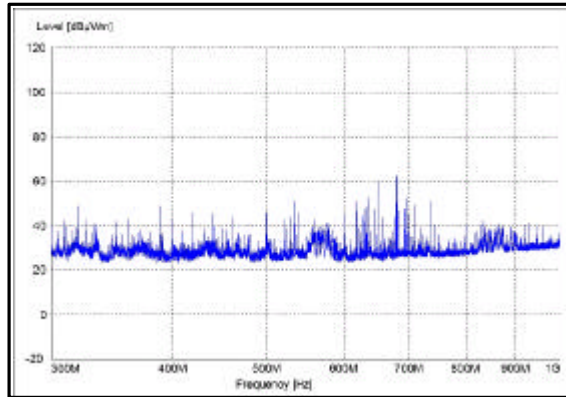
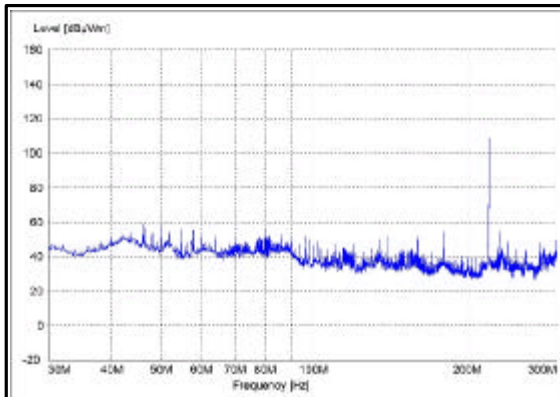
1) Core Protection Calculator(CPC) ,

(1) : CPC, : CPC



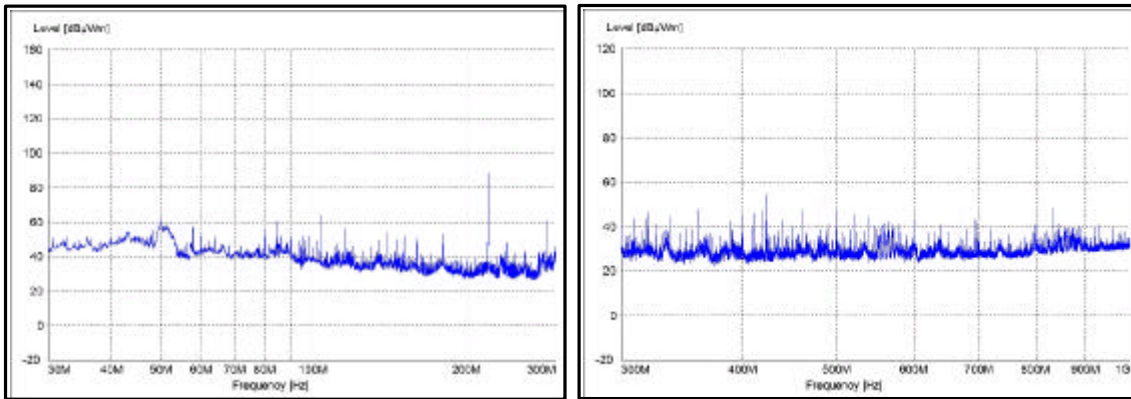
(MHz)	220.5	441.0	661.5
(dB μ V/m)	129.4	62.5	51.4

(2) : CPC, : MCR



(MHz)	220.5	441.0	661.5
(dB μ V/m)	108.7	-	-

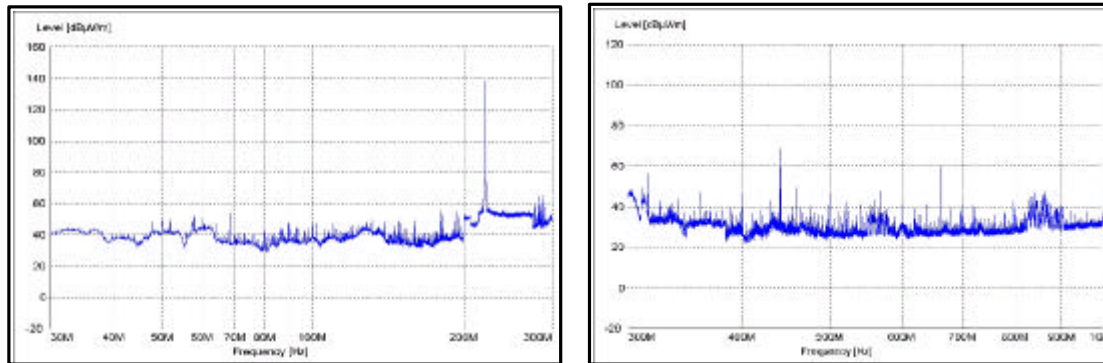
(3) : CPC, : PCS



(MHz)	220.5	441.0	661.5
(dB μ V/m)	88.5	-	-

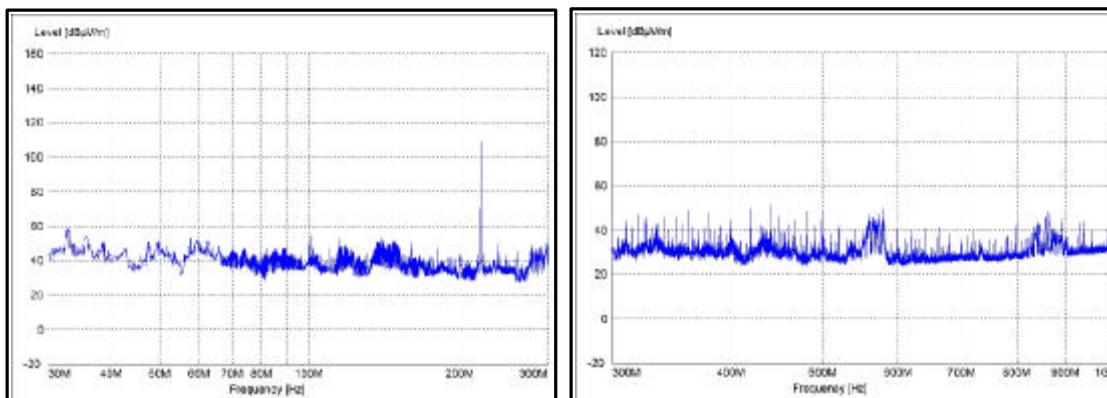
2. Core Protection Calculator(CPC) ,

(1) : CPC, : CPC



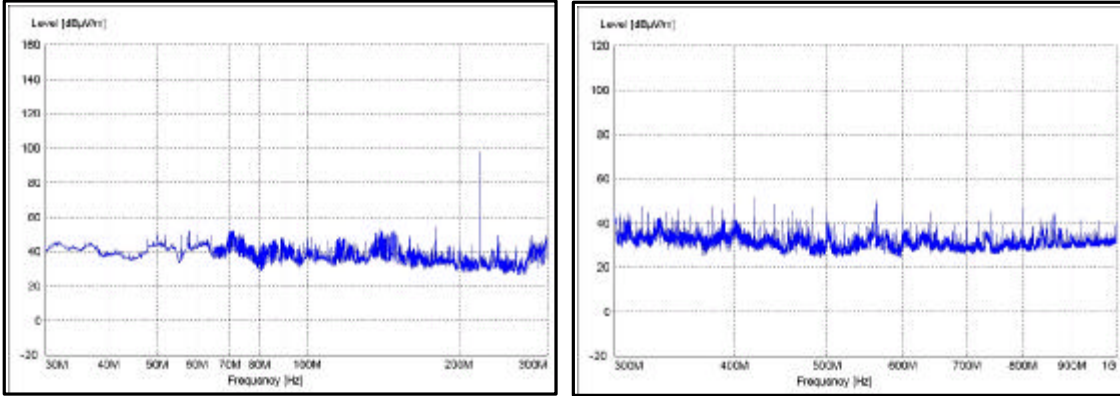
(MHz)	220.5	441.0	661.5
(dB μ V/m)	138.3	68.9	60.0

(2) : CPC, : MCR



(MHz)	220.5	441.0	661.5
(dB μV/m)	108.9	-	-

(3) : CPC, : PCS



(MHz)	220.5	441.0	661.5
(dB μV/m)	98.2	-	-

4.

(4V/m)

(10V/m)

8dB

$$V_d = (30P)^{0.5} / d$$

P : (w)

d : (m)

Vd : (V/m)

8dB 가
가

가

. dB μ V/m V/m
dB μ V

$$dB \mu V = 20 \log \left(\frac{Volts}{1 \mu V} \right)$$

CPC

129.4 dB μ V

V/m

$$129.4 \text{ dB } \mu\text{V} = 20 \log \frac{V}{1 \text{ dB } \mu\text{V}}$$

가 $V = 3.16 \text{ V/m}$

CPC

138.3 dB μV

$V = 8.22 \text{ V/m}$

(10 V/m)

3.3W

가

가

1m

1m

가

가

10V/m

가

가 220MHz

CPC

441.0 MHz

62.5 dB μV

661.5 MHz

51.4 dB μV

가

1m

10 V/m

3.3 W

5.

1m

3W

가

3W

가

가

1m

가

6.

[1] EPRI TR-102323-R1, "Guideline for Electromagnetic Interference Testing in Power Plants" Jan. 1997.

[2] , , , , " 가 ", KINS/RR-015, 2000. 5.

[3] Reinaldo Perez, "Handbook of Electromagnetic Compatibility", Part I, 1995.