

Development of Water Absorption Detector with Capacitance Theory

*H. S. Kim(hskim@kepri.re.kr)¹, #Y. C. Bae(ycbae@kepri.re.kr)¹, D. Y. Lee¹, D. S. Lee²
¹ 한국전력공사 전력연구원, ²한국서부발전(주)

Key Words: Generator Stator Windings, Water Absorption Test, Leak Test, Water Absorption Detector, Capacitance

1. 가

가 , 'H'

가 flexible 가

가

가 3.

100pF

Siemens, Toshiba 가 , GE

가 EPRI TIL-1098 3 100pF 1pF

50% 가

(1),(2)

capacitance , , cross capaci- tance 4

edge field 가 (Gen-SWAD I)

가 range(0~100pF) (AH2500)

(Gen-SWAD I) 가 (KRISS) 2 offset corrected value(C₁) (C₂)

0.4%

4.

(Gen-SWAD I)

2. 가

가

가 가 (3)

1 tool

DB
(2)

8가
H'

1. H. S. Kim etc., "A Study on the Water Absorption Diagnosis Method through Capacitance Measurement for Generator Stator Windings," 2006's KSPE Spring Annual Meeting, pp 285-286
2. Y. Inoue etc., "Wet Bar Detection and Maintenance of Water-Cooled Stator Bars of Turbine Generators," PowerGen-Europe 2005
3. J. R. Krahn, "A New Diagnostic Tool For Determining and Locating Wet Electrical Insulation," Conference Record of the 2000 IEEE



Fig. 1 Water absorption detector(Gen-SWAD I)

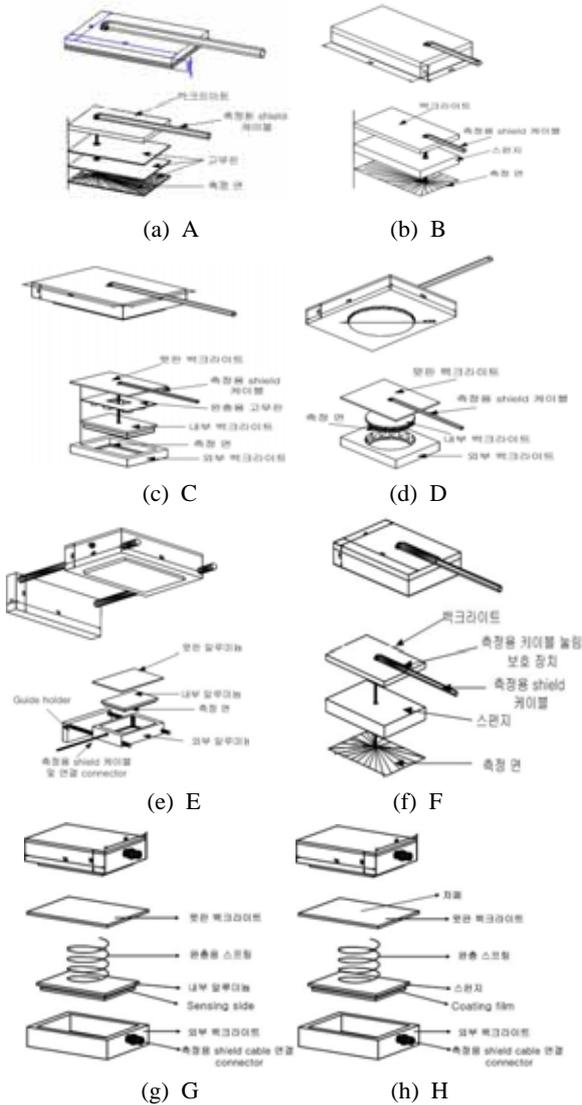


Fig. 2 Manufacture of various sensors
Table 1 Selection of an optimal sensor

Criteria	Type							
	A	B	C	D	E	F	G	H
measurement of curved surface		○	○	○	○	○	○	○
Uniform force			○	○	○	○	○	○
Shock-absorbing			○	○	○		○	○
Noise shield							○	○
Manufacturing of uniform sensor surface								○
Selection								

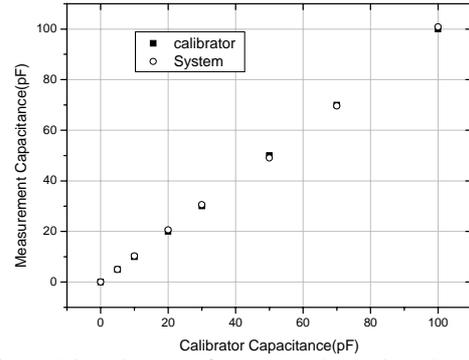
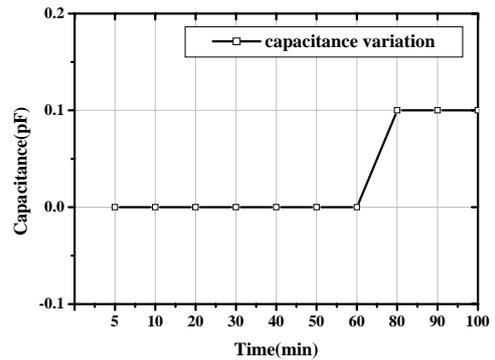
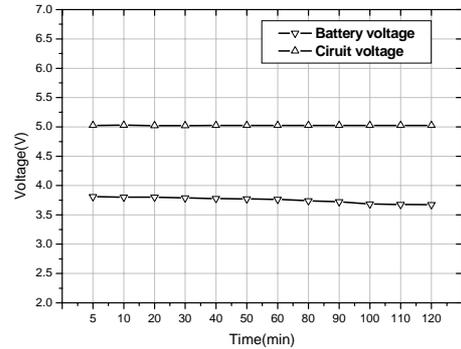


Fig. 3 Linearity test for water absorption detector



(a) Change of capacitance



(b) Change of battery/circuit voltage

Fig. 4 Stability test for water absorption detector

Table 2 Certification results of Gen-SWAD I

Setting (pF)	Corrector		Measurement C ₂ (pF)	Error (%)
	Measured (pF)	Corrected C ₁ (pF)		
0	6.47	0	0.0	0
5	11.45	4.98	5.0	0.4
10	16.67	10.19	10.2	0.1
20	6.94	20.47	20.5	0.1
30	6.82	30.35	30.3	0.2
50	5.18	8.71	48.6	0.2
70	5.69	69.22	69.0	0.3
100	7.24	00.77	9.9	0.3