

## **ULTRASONIC EXAMINATION SYSTEM TO SHOW DANGEROUS CRACKS ON CERAMIC POST INSULATORS STRUCTURE**

**Victor CARP**

Universitatea din Oradea, [victordcarp@yahoo.com](mailto:victordcarp@yahoo.com)

**Key words:** ultrasonic control, ceramic cylindrical post insulators, disconnecting switches.

**Abstract:** The ultrasonic system is a very practical one as it may signalize in a first stage, the presence of cracks and other defects in the Ceramic Post Insulators Body, directly at the Electric Fields, where they are mounted on the Disconnecting Switches. Some of the Examination Results acquired by applying this Method are forward used from other nondestructive laboratory investigation methods and this really complete a professional evaluation about the functional state of these specific Ceramic Post Insulators.

### **1. FORWARD.**

As it is well known, the ultrasonic pulse-echo testing system is applicable to detect all kind of superficial defects like pores, cracks, lacks of material, pierces, stratifications, breaks on the body of different pieces and semi-finished products.

Work procedures were the ones recommended in ASTM E 317–98–Standard practice, Code ASME Sect. V, Art. 6, Art. 24; ASME Sect. III NB, ND; ASME Sect. IX, Ed. 98; SR EN 473-2003.

Specific equipments, like Deprecator scope KRÄUTKRAMER, USM 35 X and different types of palpates, are all of them of high quality.

Work proceedings have been performed by qualified laboratory staff, according to SR EN 12223- 2001 Nondestructive Examination. Ultra sonic Examination.

### **2. EXAMINATION RESULTS.**

Our investigation started with some Ultrasonic Examination, directly in the Electric Fields at Alesd and Oradea and afterwards in the nondestructive research laboratories of Bucharest Politehnica University on very different Cylindrical Ceramics Insulators.

There have been used “normal palpates”, initially applied on the exterior surface of the Ceramic Body on both important zones, the one between inferior cup and the first row of the ceramics body and the one between superior cup and the last row of ceramic material. No have been found discontinuities.

In the next phase, there have been examined the inferior zone, through the metallic cup hole, as is presented in Fig.2.1 .

There have been found “discontinuities indication”, as they are signalized in the following diagrams (DAC –Distance Amplitude Curve ) in Fig.2.2, Fig.2.3, Fig.2.4. ,

for the most part at the bottom of the ceramic body, covered by metallic cup, but also along the ceramic body and at the top of it.

Zonă  
palpare



Fig.2.1. Examination zone on the base of Ceramic Post Insulator.

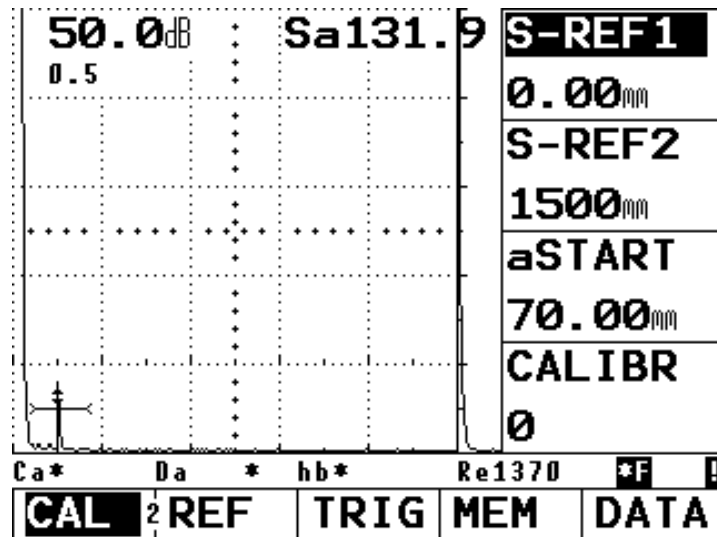


Fig. 2.2. Discontinuity indication at 131.9 mm

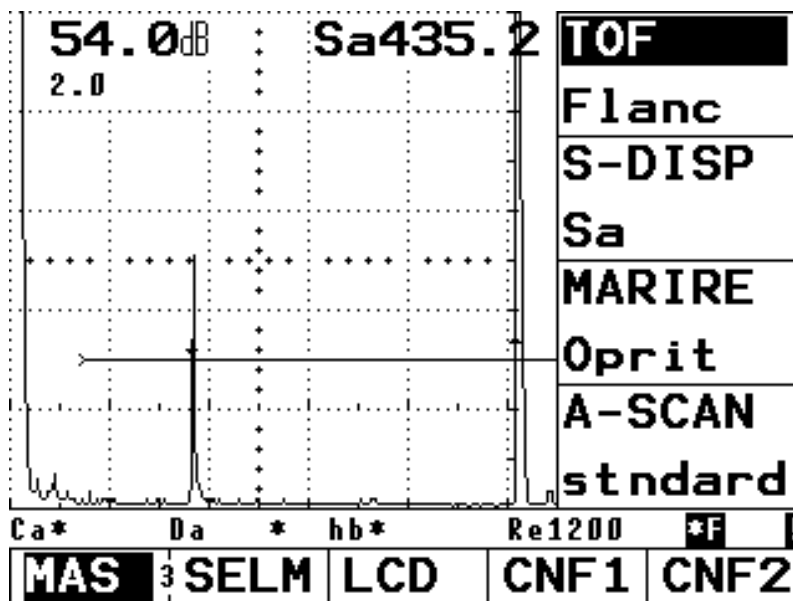


Fig. 2.3. Discontinuity indication at 435.2 mm

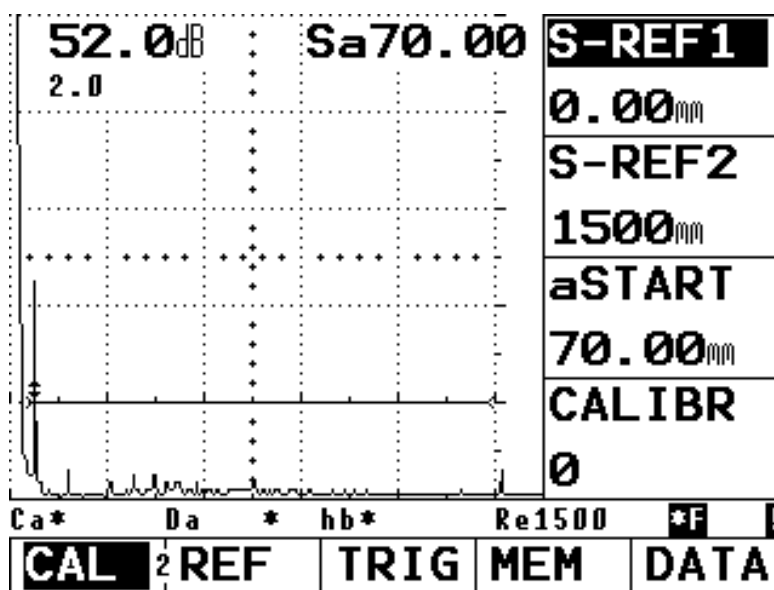


Fig. 2.4. Discontinuity indication at 70 mm.

In Fig.2.5. is presented a direct confirmation of the discontinuity indication presented by DAC diagram in Fig.2.4.



**Fig. 2.5. Confirmation of the discontinuity indication at 70 mm.**

### **3. CONCLUSIONS:**

- Taking off from the electric power of the disconnecting switches, is possible to examine the Ceramics Insulators 'integrity', at the place, where they are mounted in a structure, by applying Ultra Sonic Method, to put in evidence cracks, holes, pores, lack of materials and so on, which may have correspondence with deep inner defects;
- Taking account that 30 – 40 % of the Ceramic Post Insulators investigated, have presented "discontinuities indication" of some possible defects, this method is valuable to prevent accidental damages of the disconnecting switches;
- Ultra Sonic Method is also very practical one, as it and may be complimentary to other nondestructive laboratory procedures like thermograph in infra-red by impulses method and penetrating liquids method.

### **4. BIBLIOGRAPHY**

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