

# UOE

## Highly Efficient Automatic Ultrasonic Inspection System for Weld Seam of UOE Pipe

Yukinori Iizuka  
Yasuhiro Matsufuji  
Kozo Maeda  
Susumu Iwakura

fifl %#  
f&f

fifl \$##

*NKK has developed a new automatic ultrasonic inspection system for weld seam of UOE pipe. The features of the system are two manipulators that can be used max.20ch probes, a high sensitivity detection technique for center minute defect and a high accurate seam-tracking sensor. We believe the specification of the system will perfectly meet various and strict customer's inspection needs.*

1. (1) 20  
(2)  
(3)  
(4) S/N>10dB  
UOE Photo 1 Fig.1  
UOE Table 1  
2 2 100  
S/N (Signal to Noise  
ratio)

1)-4)

2  
2 1

SNUP

SNUP

Seam  
sor Sen

OB

-----

Process  
Com

Configuration of the system

Fig.1

| Item                             | Specification                                       |
|----------------------------------|---|
| Pipe size                        | Diameter 19mm, 50.422mm<br>Length 56.4mm<br>Table 1 |
| Inspection method                | 10MHz/-3dB<br>Max. gain : 100dB<br>PRF 1kHz/ch      |
| Pulser & receiver (Krautkramer)  | 0.5MHz  |
| Number of channel                | L&T : max. 16ch<br>OB : max. 4ch                    |
| 1.6mm drilled hole Detectability |   |
| Coupling method                  | L,T : Water gap(0.5mm)<br>OB : Water column (40mm)  |

UOE

2 6

4)

2 7

PC

Fig.5 Example of the auto-correlation of a chirp pulse and a conventional spike pulse

3 2

60,, 70,,  
Skip 0.25 0.75

Fig.6

3)

S/N  
(2)  
(3)  
.....(2)  
.....(3)

|      |          |      |           |
|------|----------|------|-----------|
| D    | Diameter | t    | Thickness |
|      | (2)      | t /D | 6%        |
| 70,, |          | 1%   | 82,,      |
|      | 70,,     |      | 70,,      |
|      |          |      | S/N       |

“

Fig.7