KONHA NDT ORIGINAL SOLUTIONS	**KEDDY SOFTWARE** **Description of KEDDY IMPLANTING MODULE**

Data of KONHA.Ltd. Keddy software based on Kozloduy NPP EAD

"CALL FOR MARKET CONSULTATION No. 57652"

Zagreb, 05.02.2026

Dear Sir,

In accordance with Kozloduy NPP EAD "CALL FOR MARKET CONSULTATION No. 57652" we are glad to submit You the following data related to '**Delivery and implementation of software for implanting eddy current testing signals of defects in eddy current testing signals from a pipe'.**

1. Detailed requested data

- Detailed description is given in Appendix 1. See next page.,
- Price of software without VAT is 32 000,00 Euro. It includes 10 license USB sticks, 3 days training in KONHA laboratory in Zagreb and user manual.
- Delivery period is 2 months after the date of signing Contract from Buyer side
- After delivery of software and performance of training in Zagreb Buyer has to pay contract value in time interval not greater than 15 calendar days.
- Warranty period is 24 months after delivery of software to representative of Kozloduy NPP EAD.
- During the warranty period free phone, E mail, What's up consultation are available.
- Contact person is dr.sc.Berislav Nadinić dipl.ing.mech. His phone number is +385 99 4920 470. E mail: bnadinic@konha.hr. Website: www.konha.hr

2. APPENDIX 1

Technical specification of software for implanting eddy current testing signals of defects in eddy current testing signals from a pipe

Keddy software has the following characteristics:

- Keddy software visualizes the signal from the pipes and calibration standards;
- Keddy software allows signal calibration from calibration standards;
- Keddy software allows selection of any signal portion from a pipe or calibration unit.
- Keddy software allows implanting of any signal from any calibration block or from any SG tube in another calibration block on any other tube; The number of implanted signals on let say one tube is unlimited. Each implant can change their position on place of implantation in accordance with operator wishes.
- Scaling and rotation may be applied to the selected signal, before implanting;
- The implanting does not change the number of signal reports from the target pipe;
- Saving changes to a file do not change the file format;
- The Keddy software supports data from the following techniques: 'Bobbin', 'MRPC', '+Point', 'Array'. Keddy software does not support X probes.
- The Keddy software supports the following eddy current testing data formats: MIZ-30 and MIZ-85;
- Keddy software is working on any computer with Windows;
- The Keddy software interface is English.

Some examples of using Keddy implanting module are on the next pages.

Keddy Implanting software

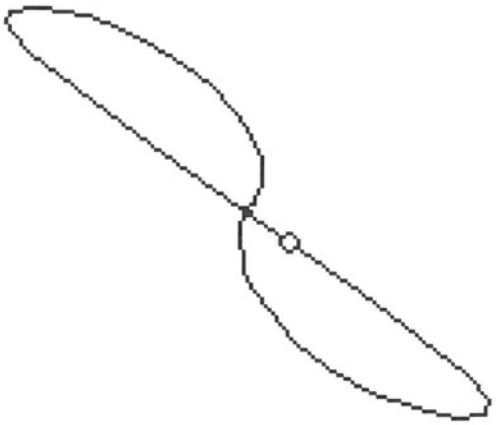
Before presentation of Keddy implanting software some important facts have to be noted.

1. If we want to implant one signal to the another signal and monitor the composite signal the following preconditions have to be met:
    a. Both signals have to be generated with the same dps (data point per second). Usually, Konha team is using 1000 dps for inspection of steam generator tubes with bobbin, rotating and array probes.
    b. The both signals have to be generated using the same axial probe speed (mm/s) and same rotating speed if rotating probe is used
    c. The both signals have to be generated using identical setups made on the same calibration standard or standards which effects signal rotation, signal span, signal amplitude etc.
    d. Different channels cannot be used for making complex signal. So, you cannot implant signal cut from Channel 3 to signal cat from Channel 5, despite they are both differential channels.
    e. Keddy software allowed work in Implanting module processing channels, like mixes, filters etc.
    f. Keddy software allows saving original parts of signals but also related composite signals which are results of process of implantation (signal summation or signal substruction).
    g. All implantation work is performed on the level of particular channel which is of operator interest.

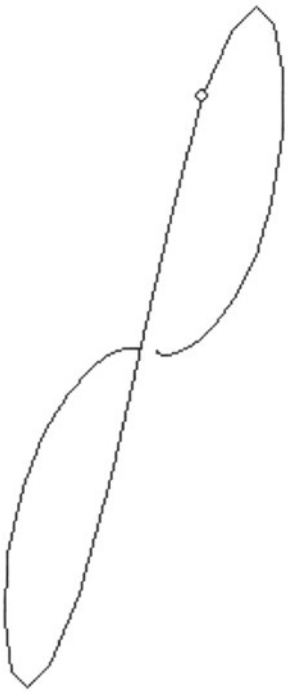
During data analysis of eddy current data from steam generator tubes the analyst is faced with many signals which can be simple (like hole in the tube) but also with many composite signals which can be difficult to analyze because they consist of two or more signals.

For example, let see how the signal of 100% hole on calibration standard looks if this hole is implanted on different places of internal 10% groove which signal we will take also from calibration standard (same calibration).

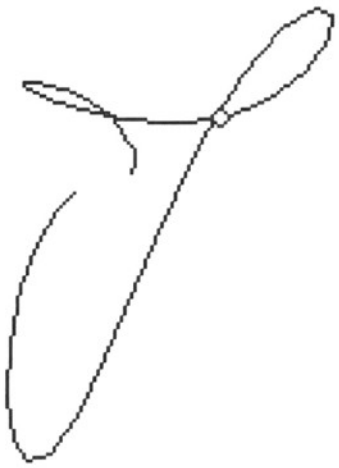
Signal of 100% hole:



Signal of 10% OD groove:



Position 1 We put the hole on the first edge of the 10% OD groove and we will get the composite signal which looks like this:



Position 2 We put hole in the middle of the 10% OD groove:

Position 3 We put the hole on the second edge of the 10% OD groove:

It is obvious that composite signals obtained by two degradations summed together are different depending on the position of 100% hole (first edge, middle, second edge). If we will measure amplitude and phase (depth) of composite signals we will find out that we are getting very different results, and neither one is warning us that we have 100% hole. This means that we can leave this particular tube in service and after that we will have the problem with leak, etc.

The previous is simple demonstration how effective is Keddy implanting software in data analysis is, because we can without making numerous tube samples with multiple defects, tube supports, dents, bulges, etc. material samples can learn about various situations, various composition of signals etc.

The conclusion of previous facts is that Keddy implanting software is very powerful tool, first for learning data analysts but also for understanding data obtained during inspections which effect decision-making processes.

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Заличено на основание ЗЗЛД

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