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Method for Developing Inferential Models

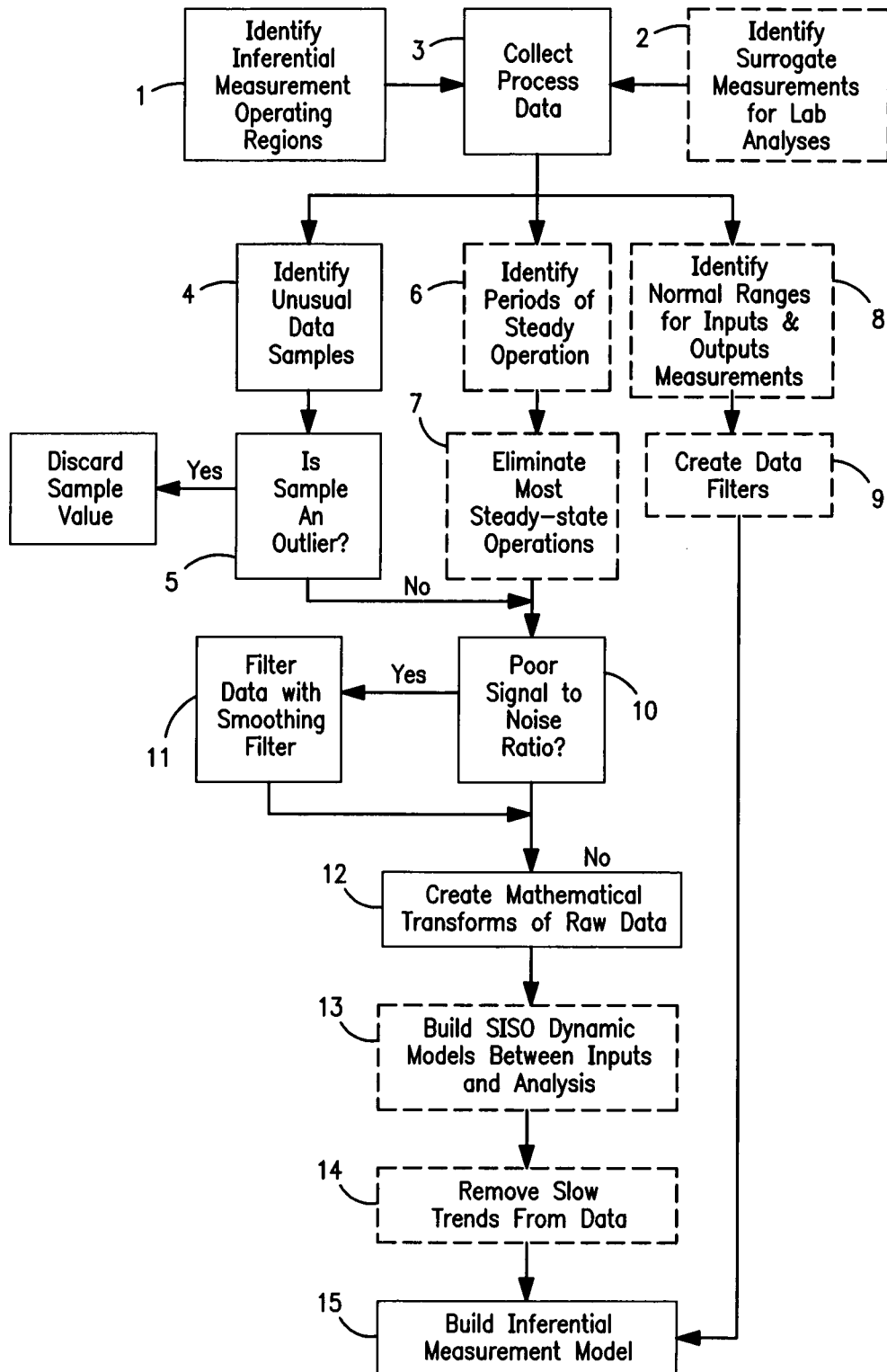


FIG. 1

On-line System for Calculating Inferential Estimates for Abnormal Event Detection

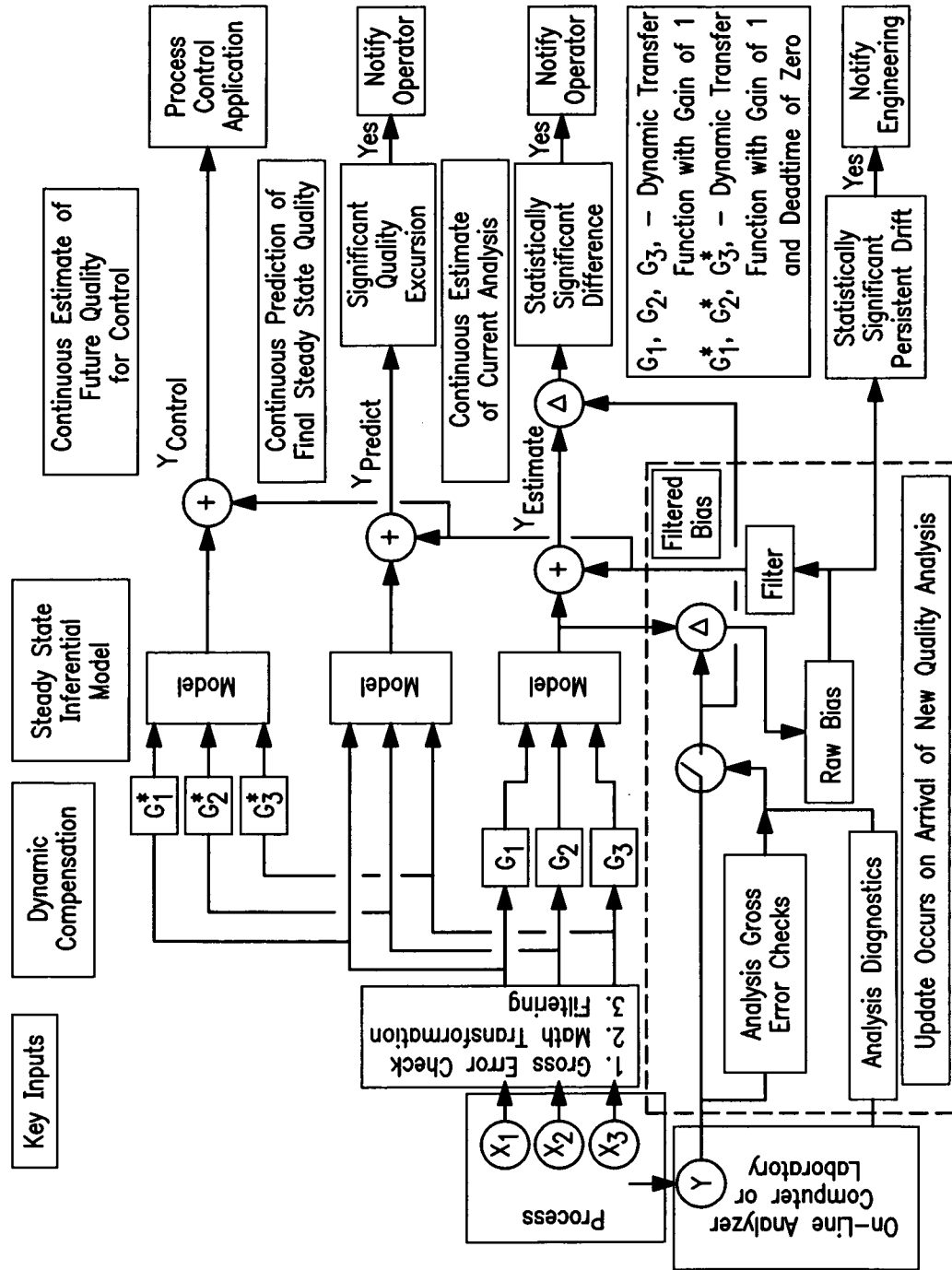
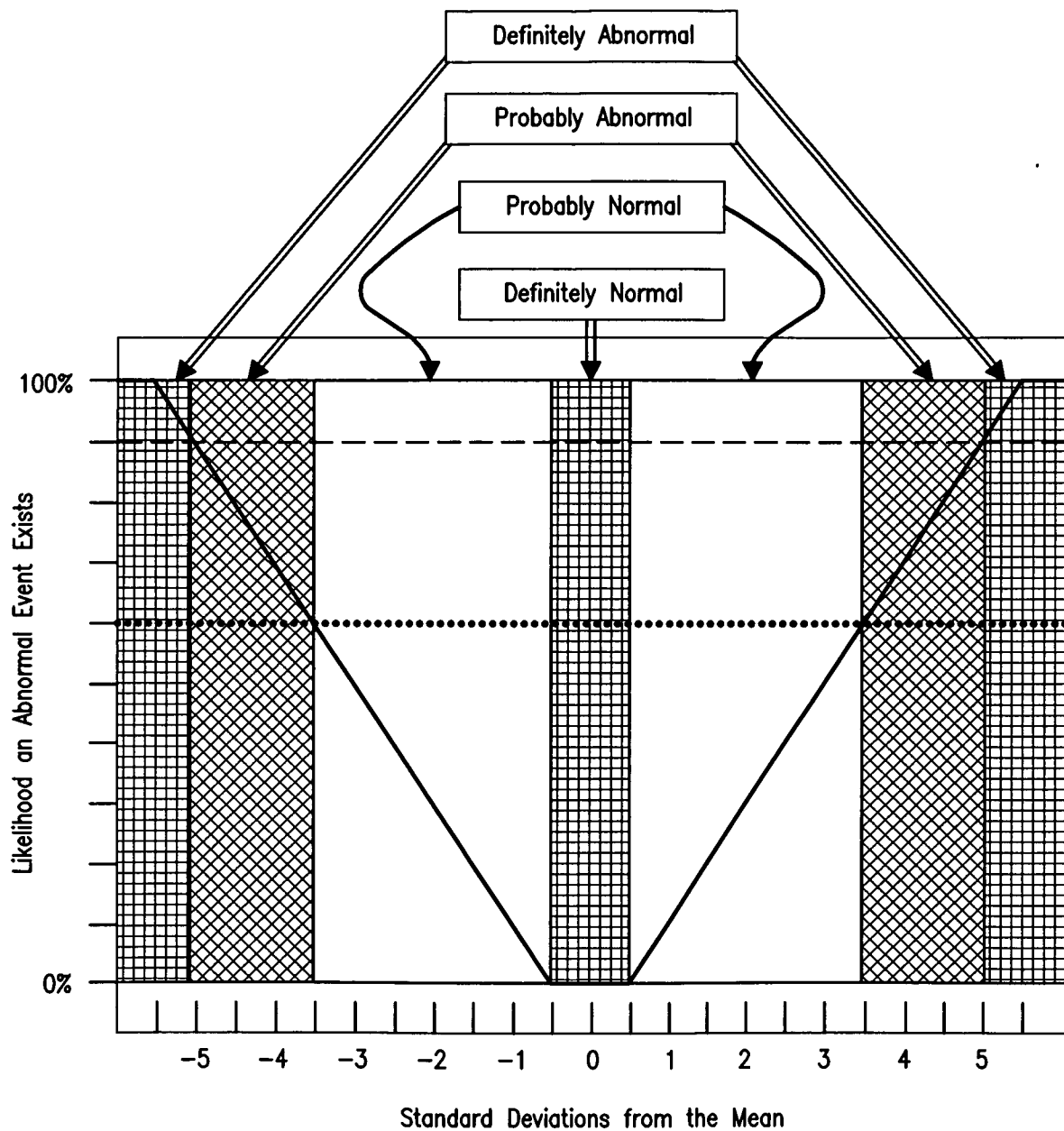


FIG. 2

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Fuzzy Conversion of Statistical Significance
to Likelihood of an Abnormal Event

**FIG. 3**

Fuzzy Net for Summarizing Likelihood of Analysis Abnormality

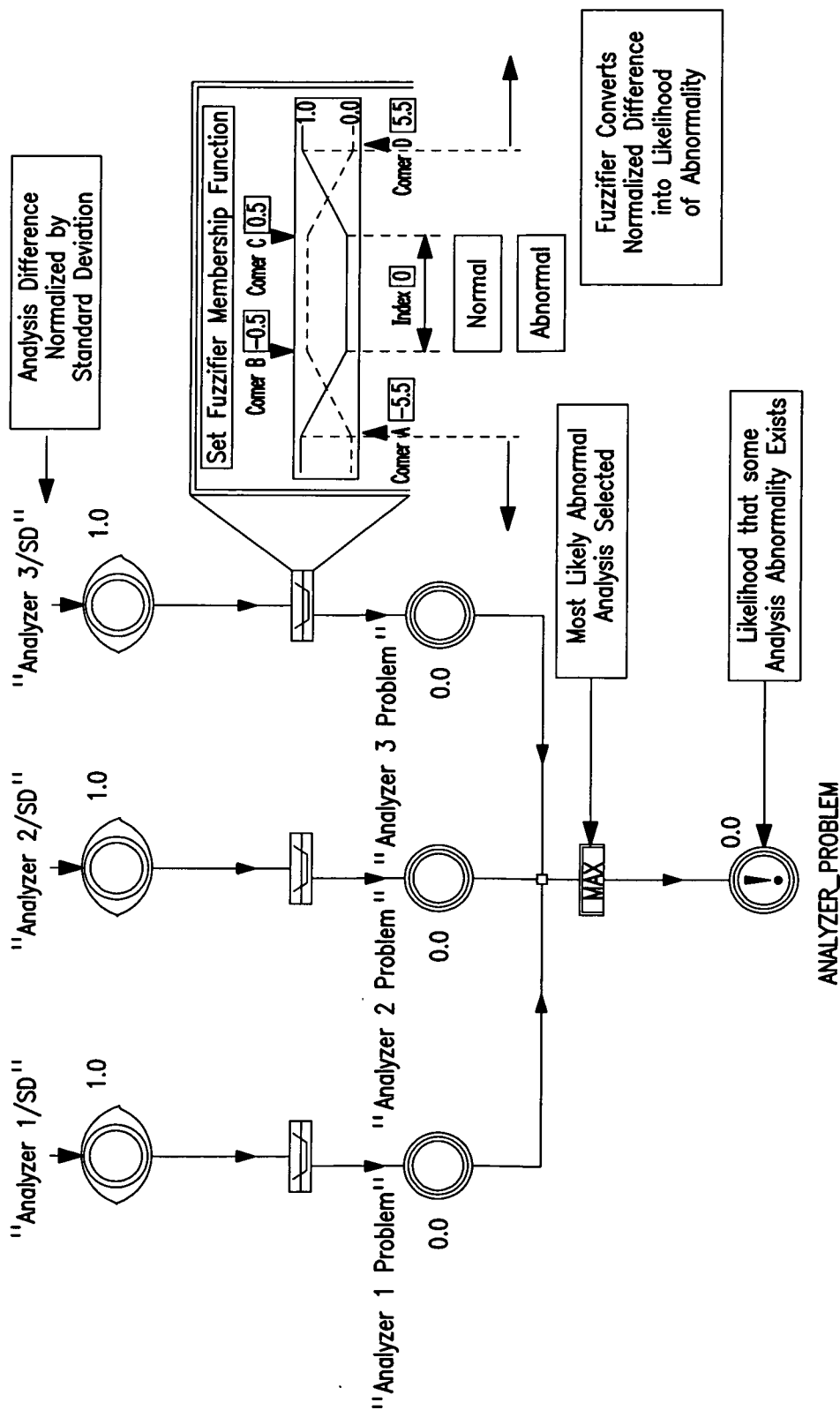


FIG. 4

Example of 90% Likelihood that $Y_{\text{Predicted}}$ will Exceed Upper Quality Limit

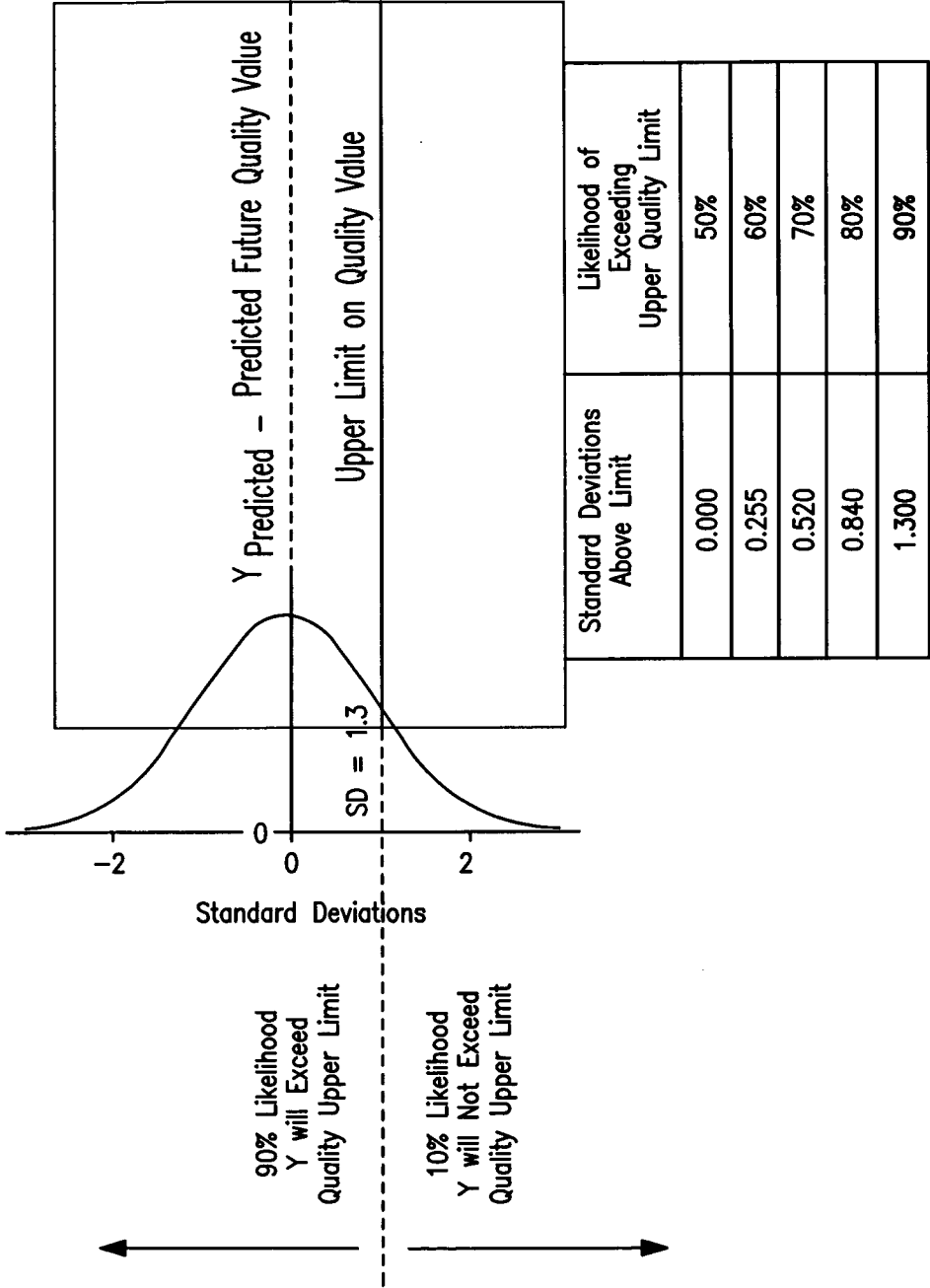


FIG. 5

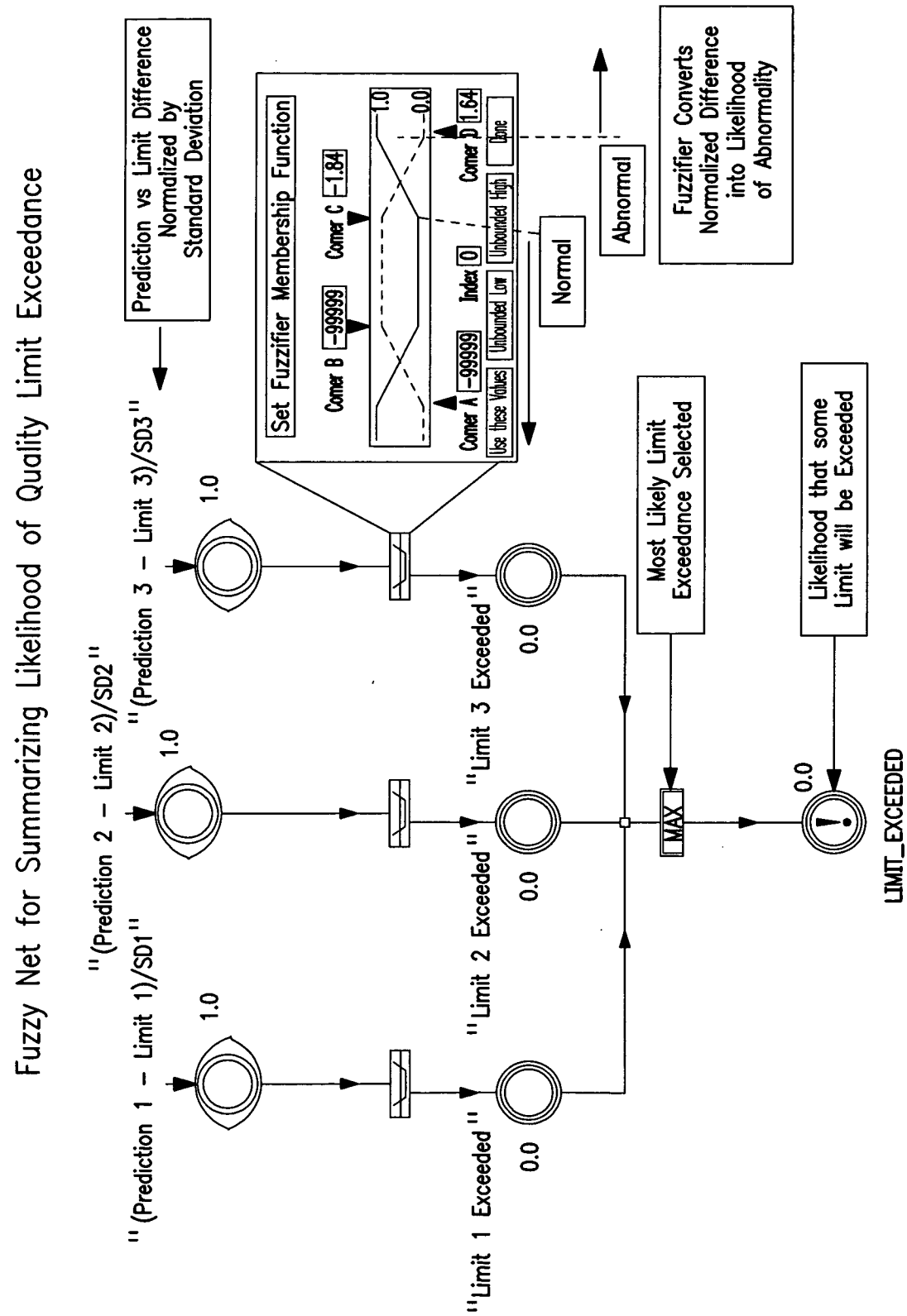


FIG. 6

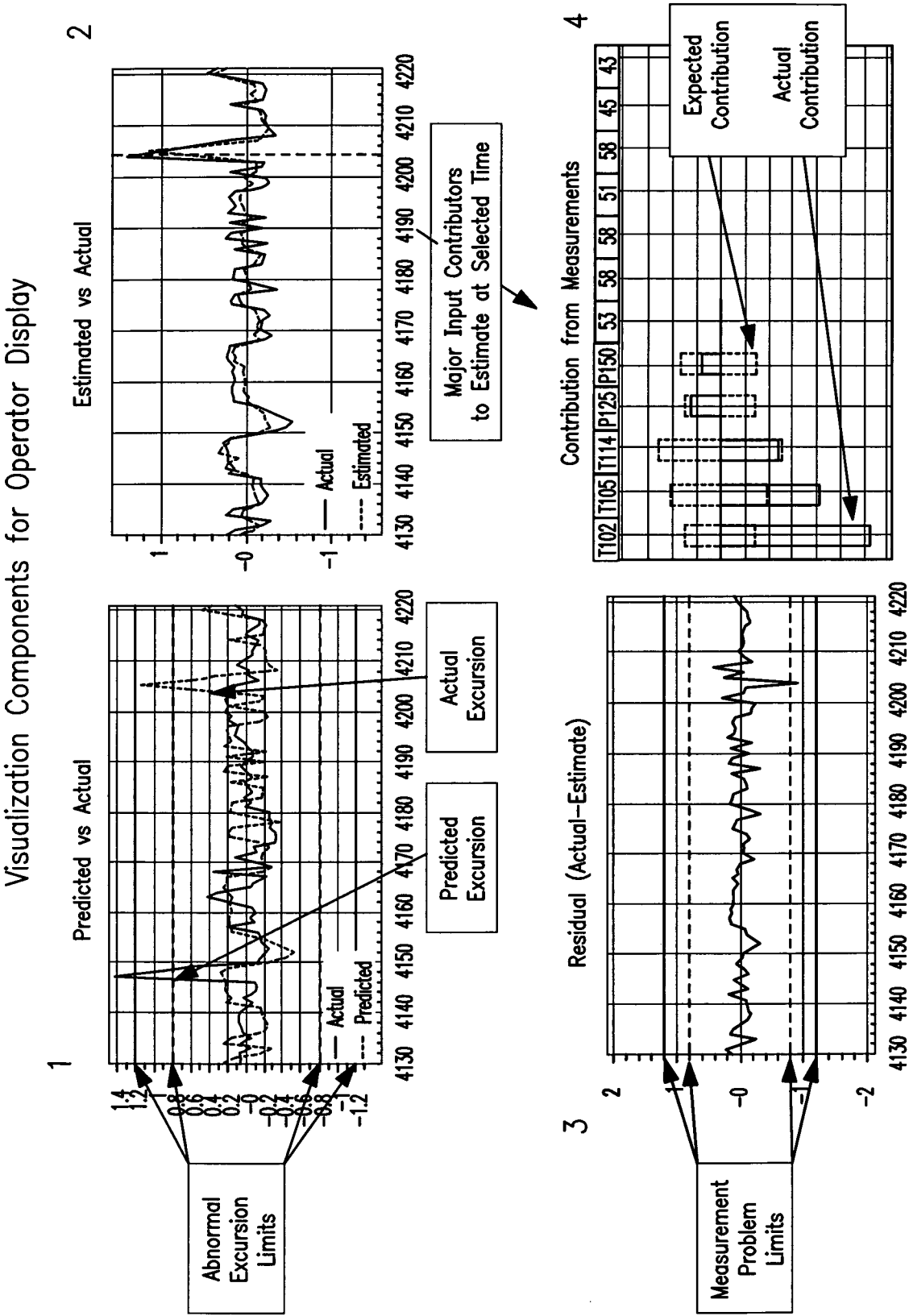


FIG. 7

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Typical Prior Art Method for Developing Inferential Models

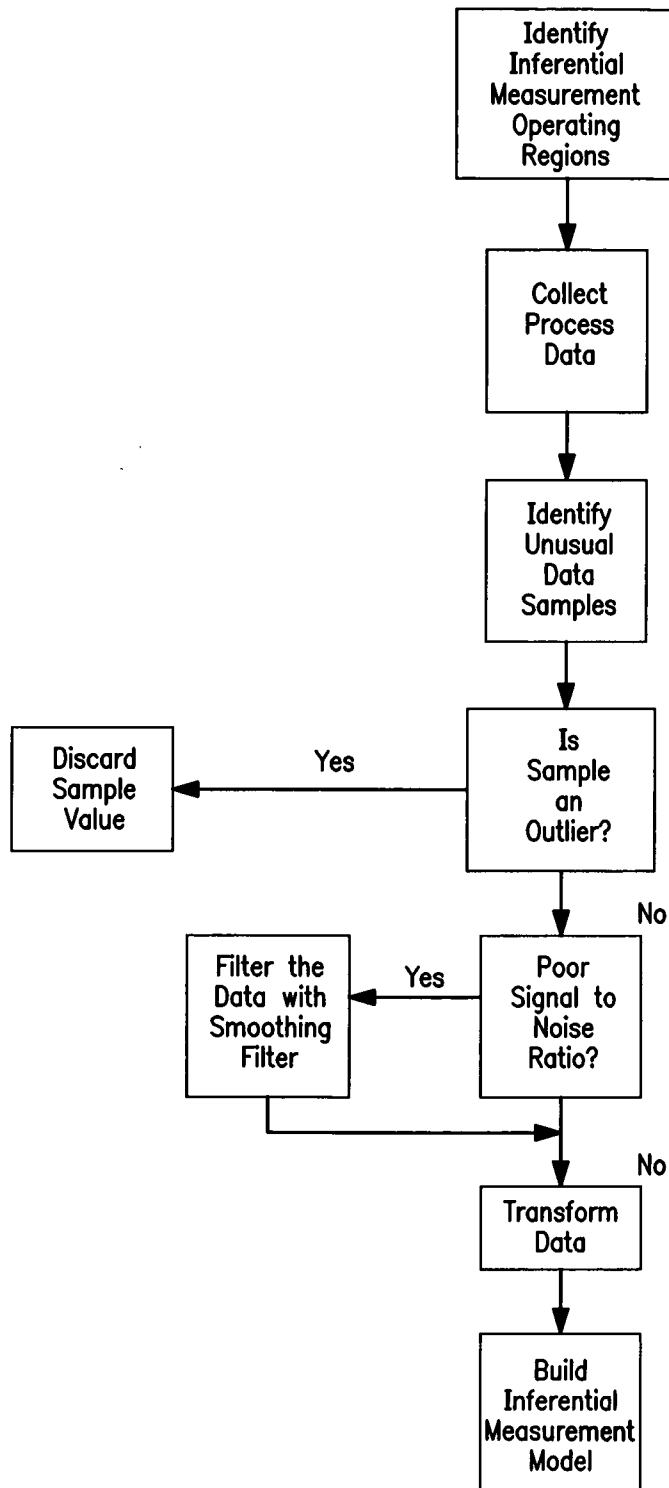


FIG. 8

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Example of Effect of Not Excluding
Steady State Operations from Training Data

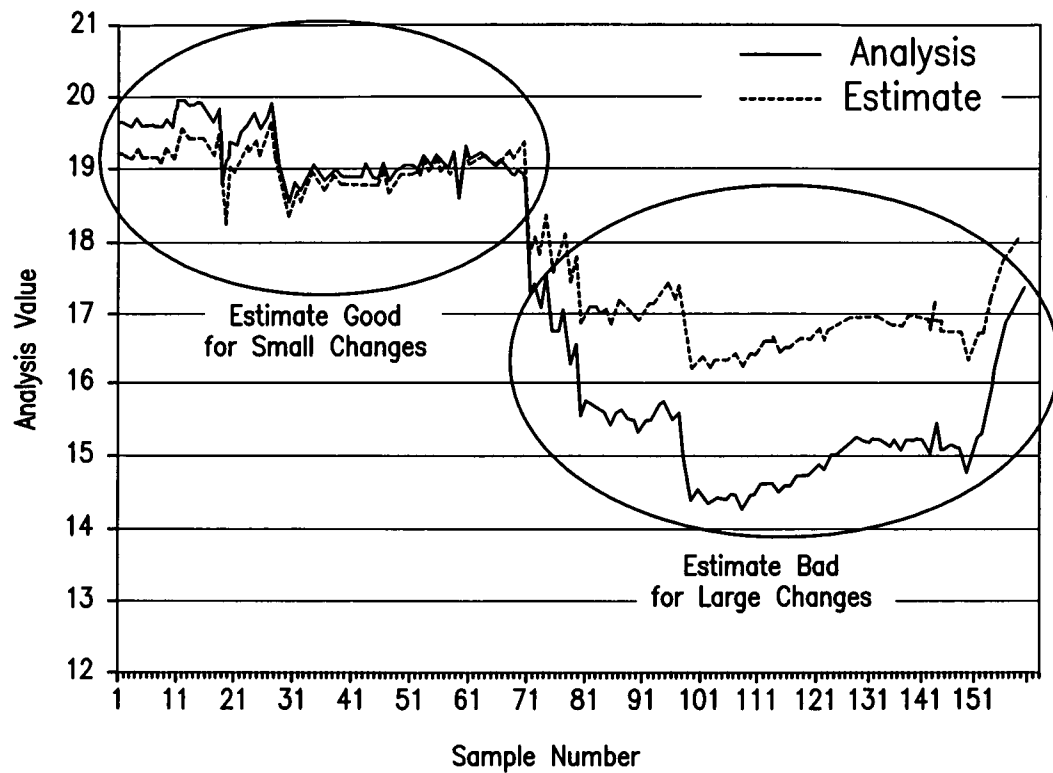
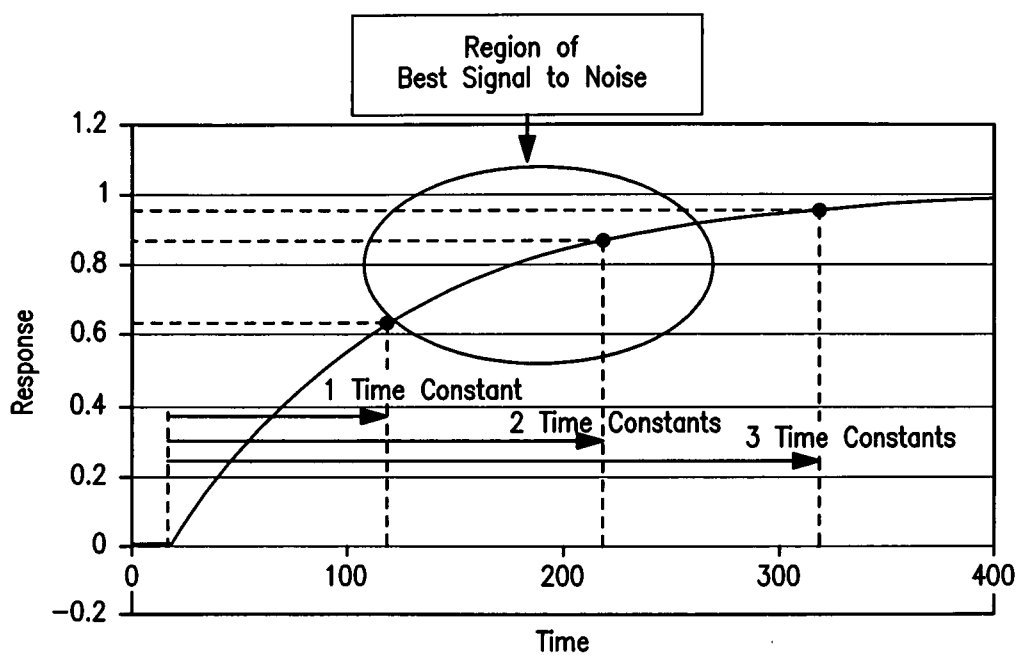


FIG. 9

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Dynamic Response of a First Order
Dead Time Process to a Step Change



Time Constants	% Response
1	0.635781
2	0.866011
3	0.950708

FIG. 10

Case Example

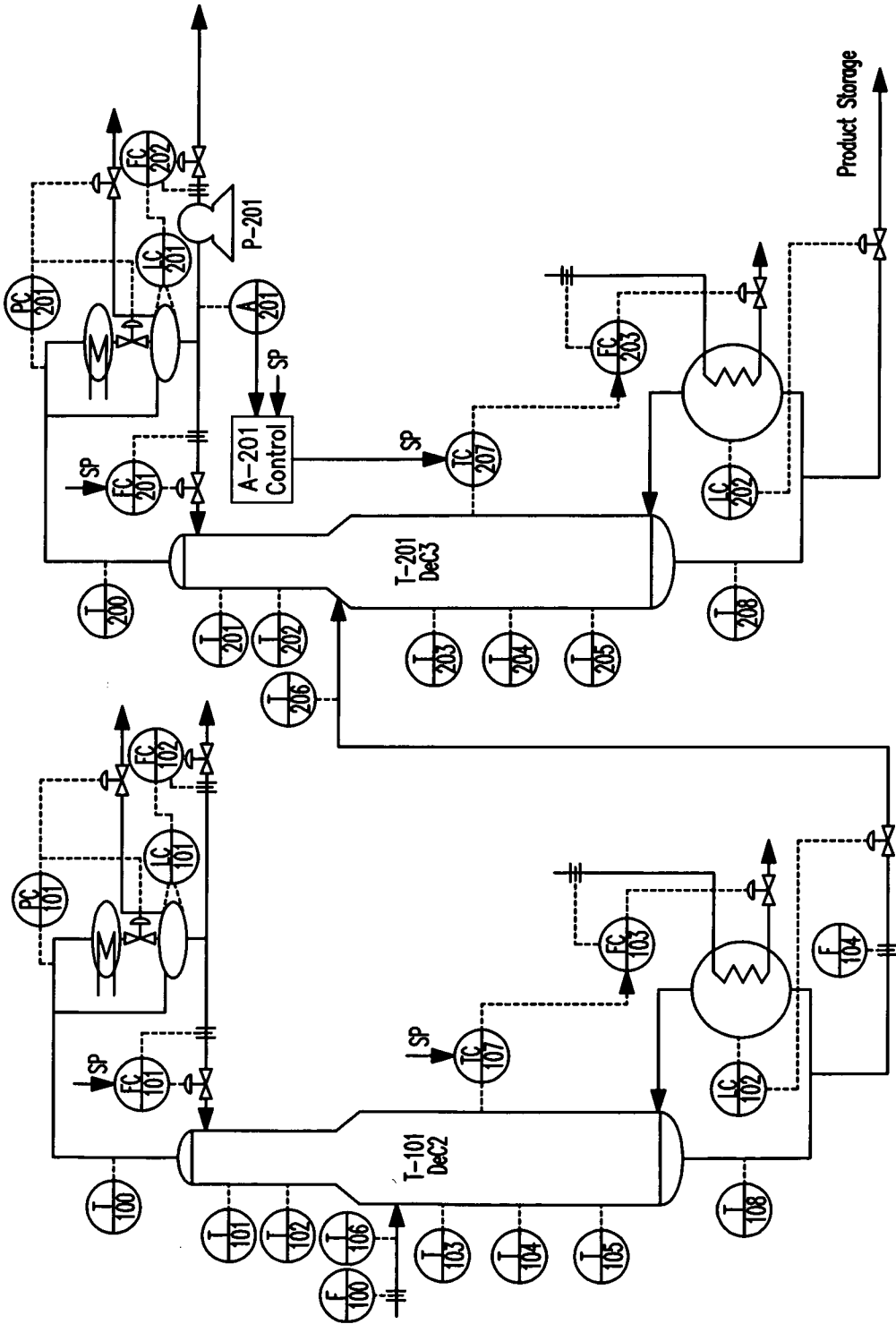
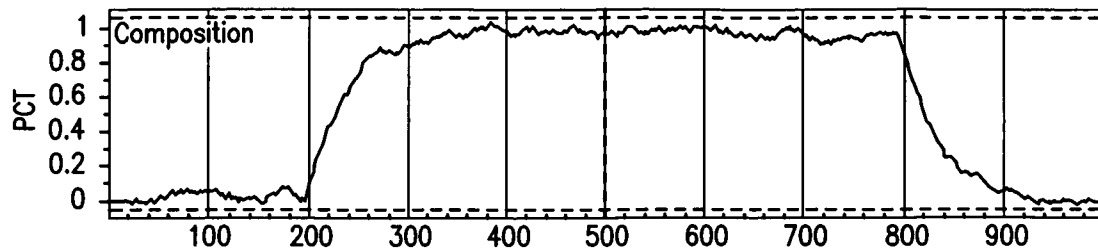
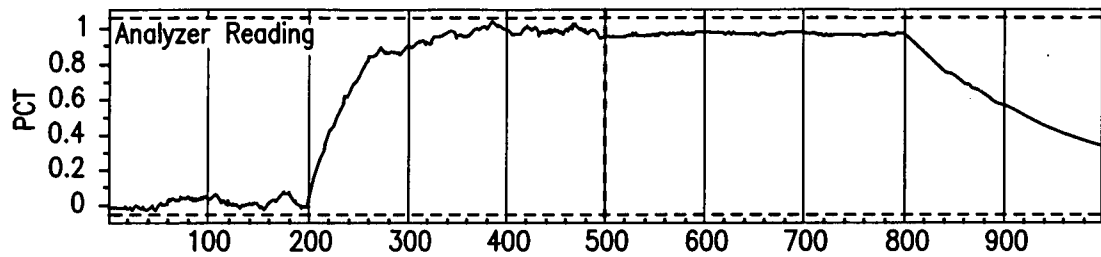
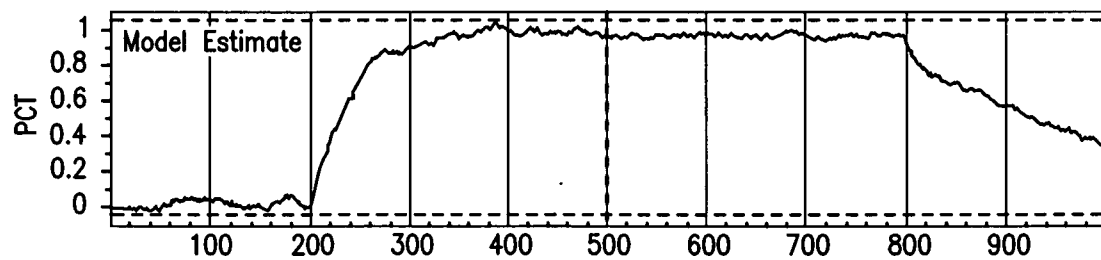
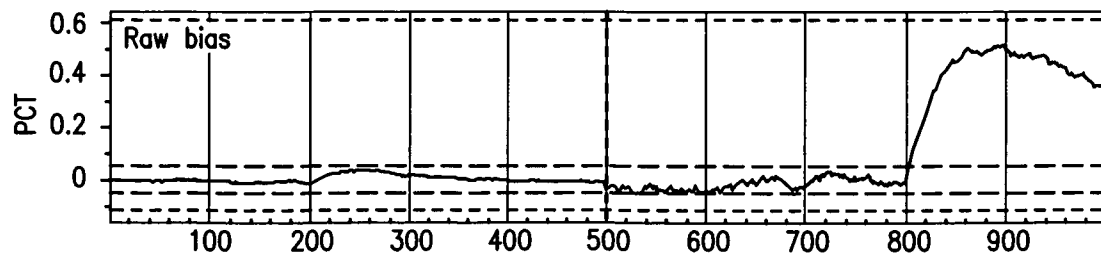


FIG. 11

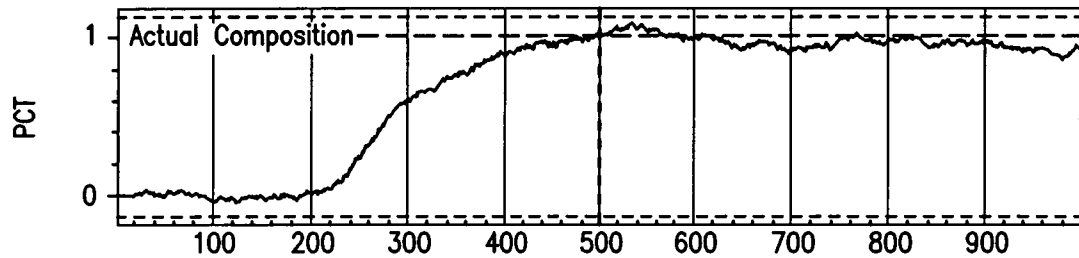
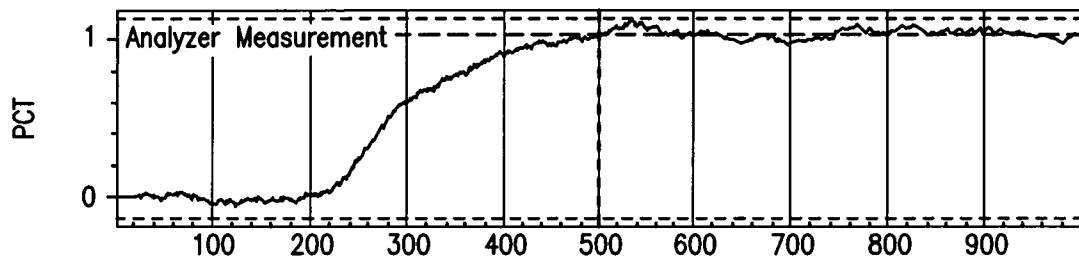
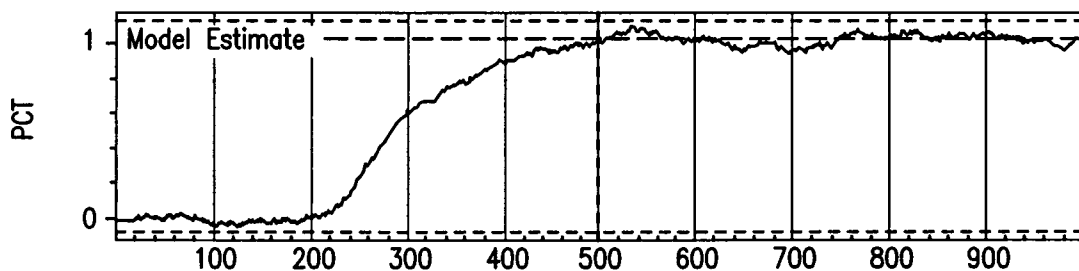
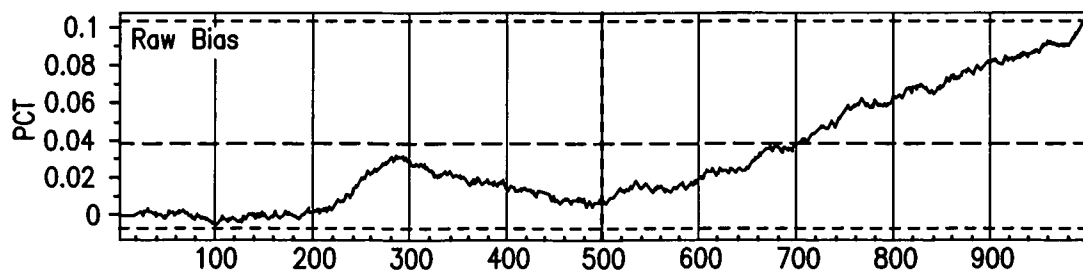
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Example of Partially Plugged Sample Line

**FIG. 12A****FIG. 12B****FIG. 12C****FIG. 12D**

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Example of Analyzer Drift

**FIG. 13A****FIG. 13B****FIG. 13C****FIG. 13D**