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Abnormal Event Detection On-Line Information Flow

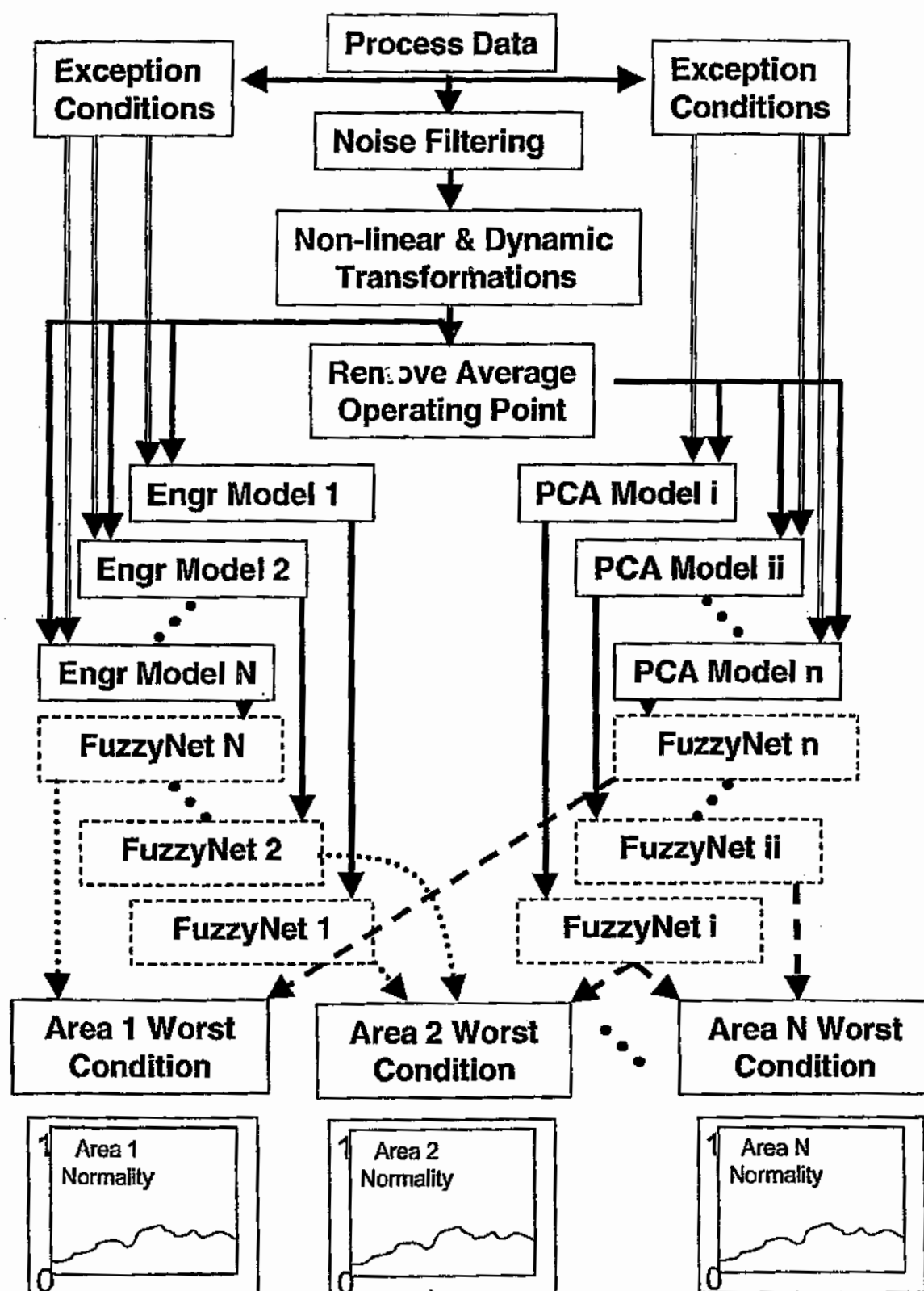


FIG. 1

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Valve to Flow Model

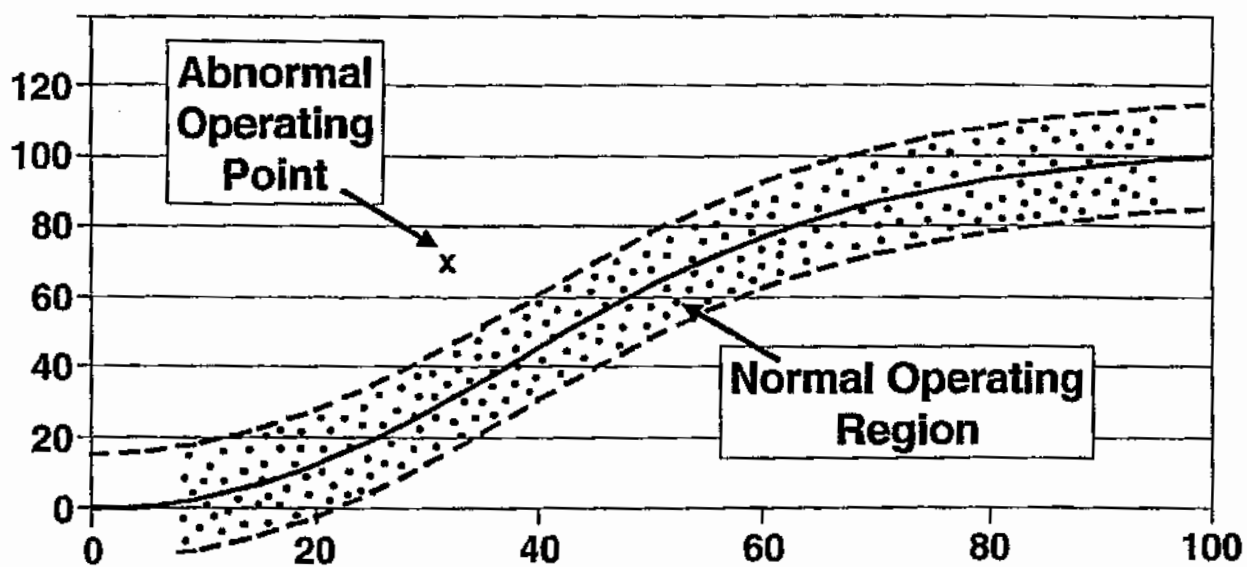


FIG. 2

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Three Dimensional Redundancy Expressed as a PCA Model

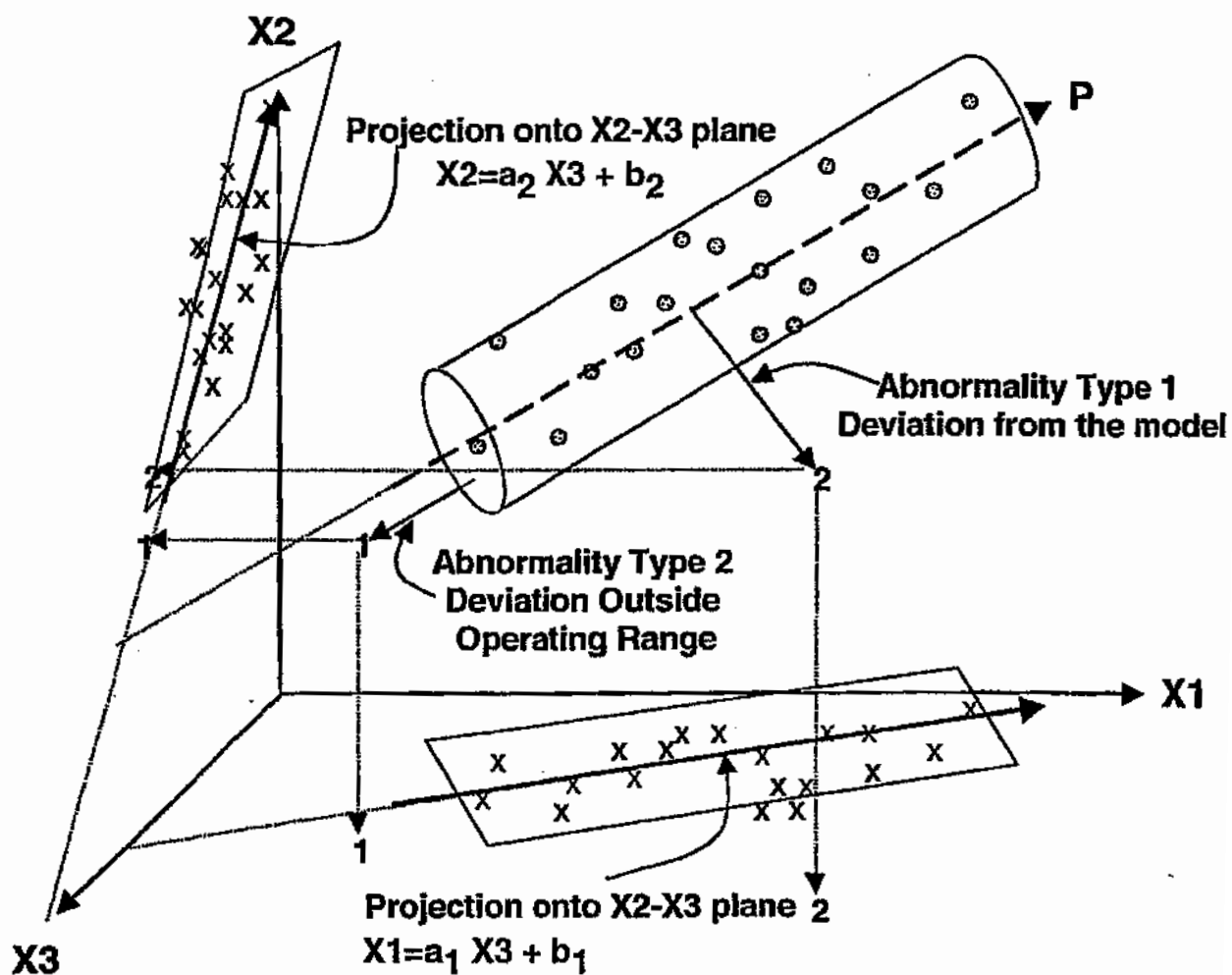


FIG. 3

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Fuzzy Network Setup

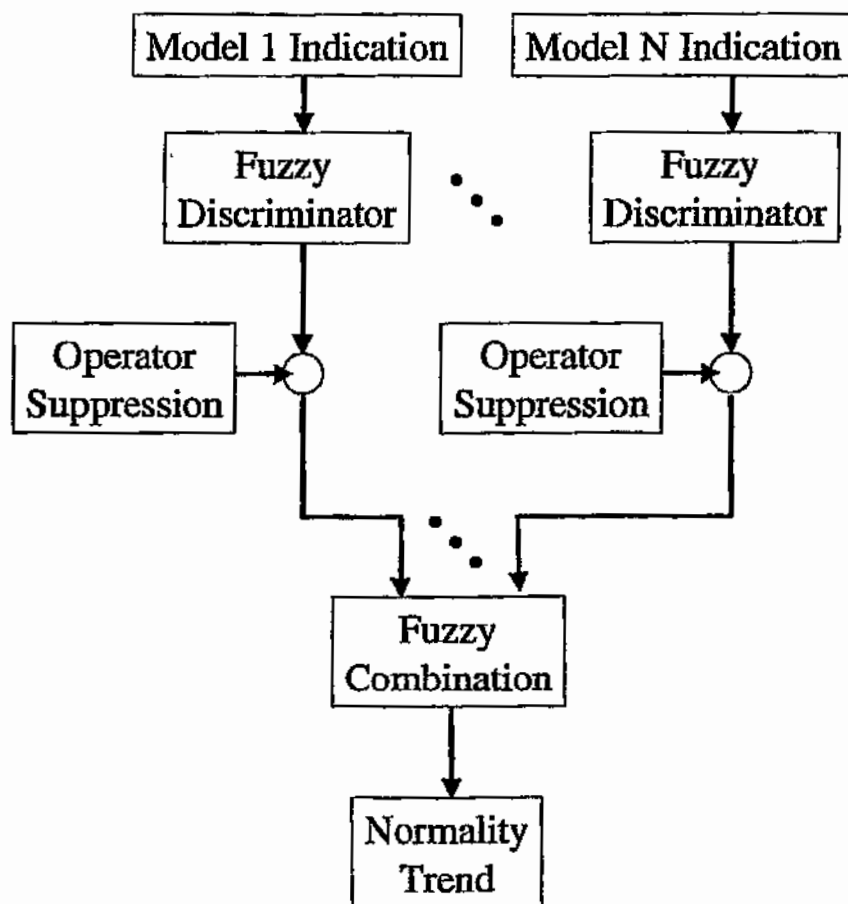
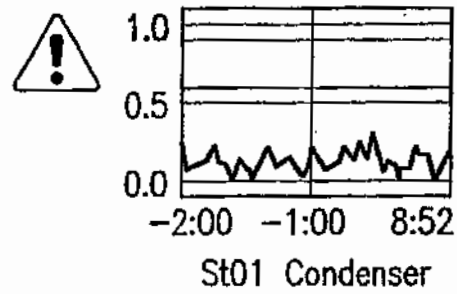


FIG. 4

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Process For Developing a PCA Abnormal Event Detector

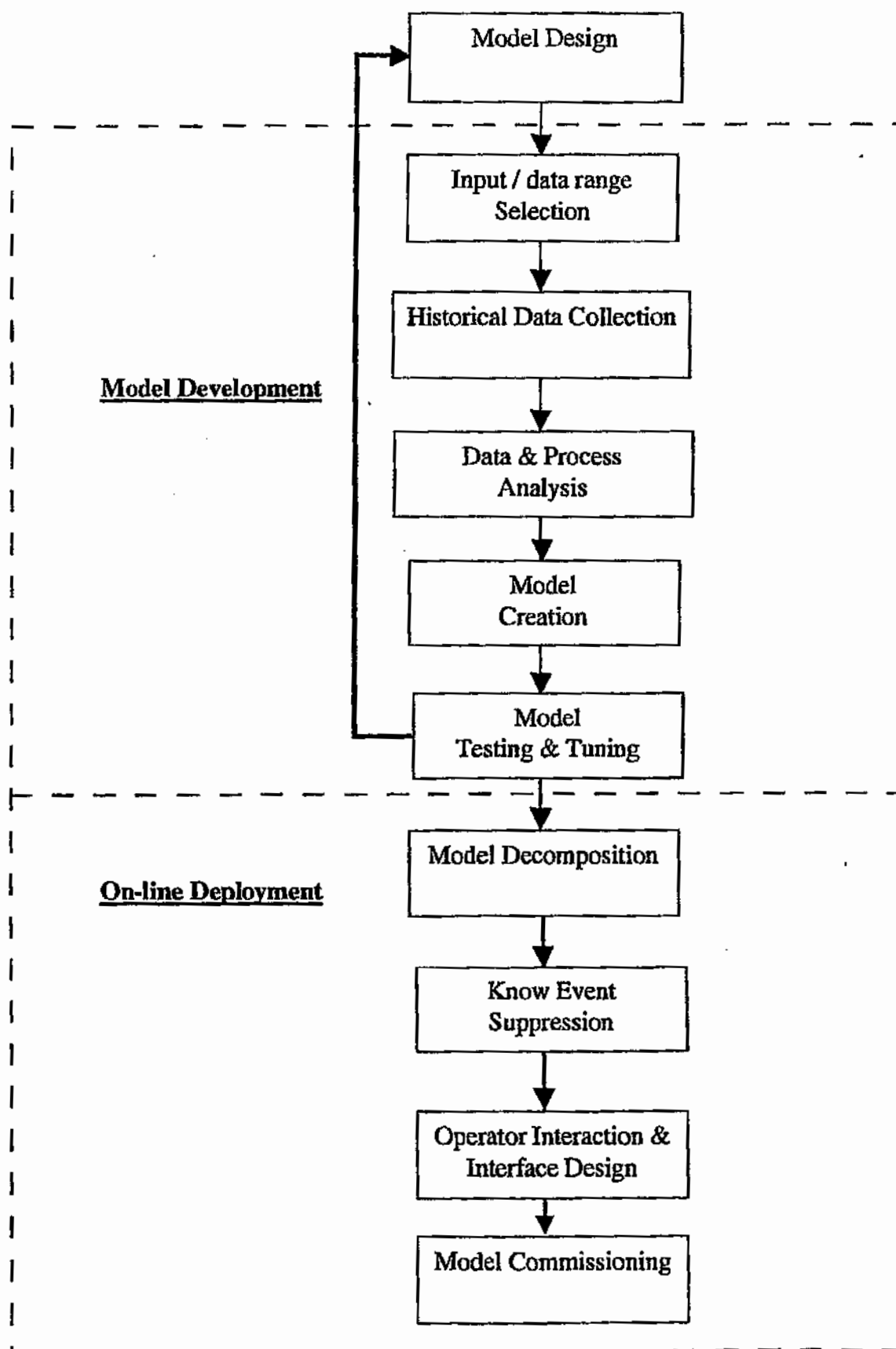
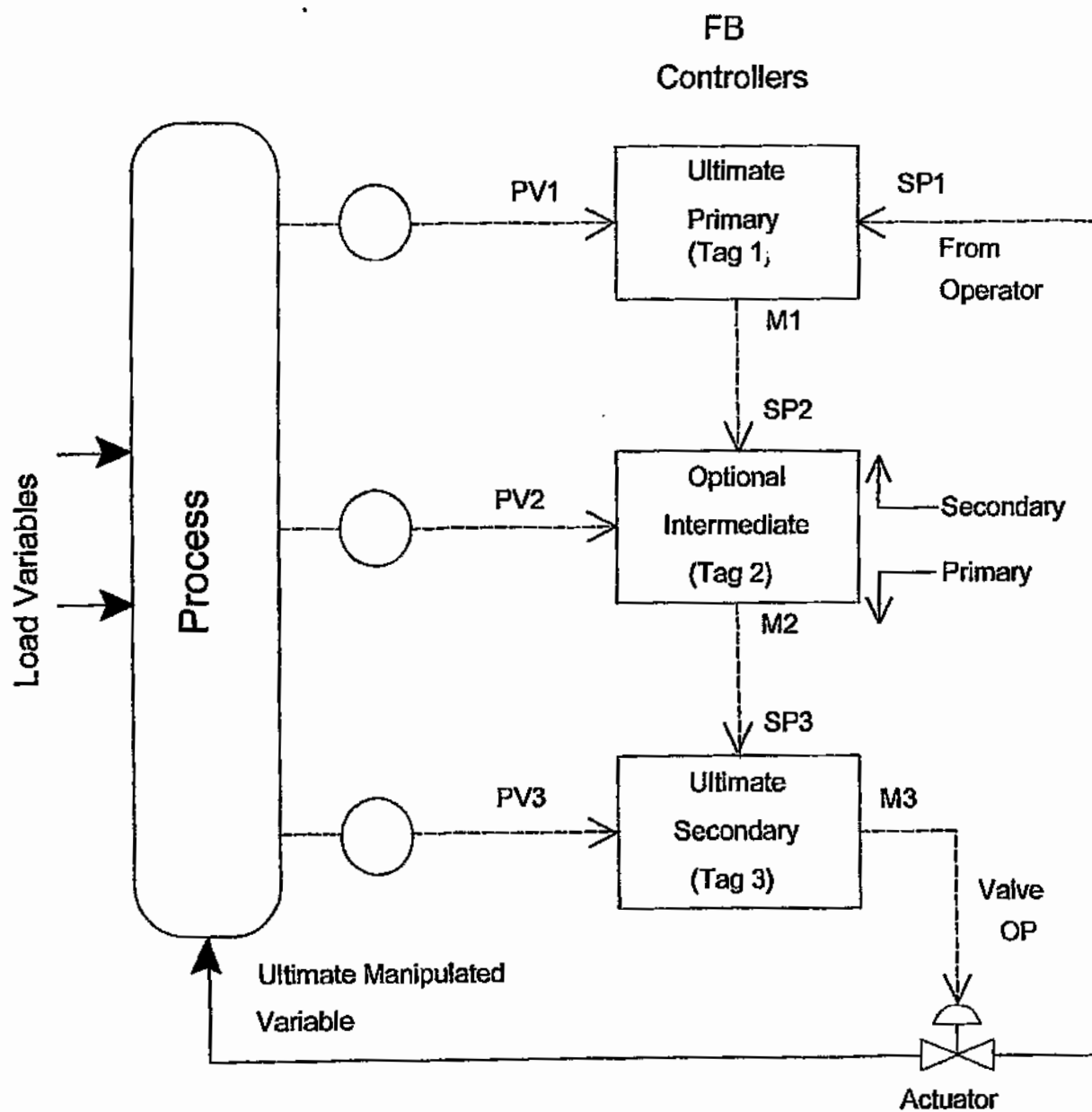


FIG. 5

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Anatomy of a Process Control Cascade

**FIG. 6**

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Anatomy of a Multivariable Constraint Controller, MVCC

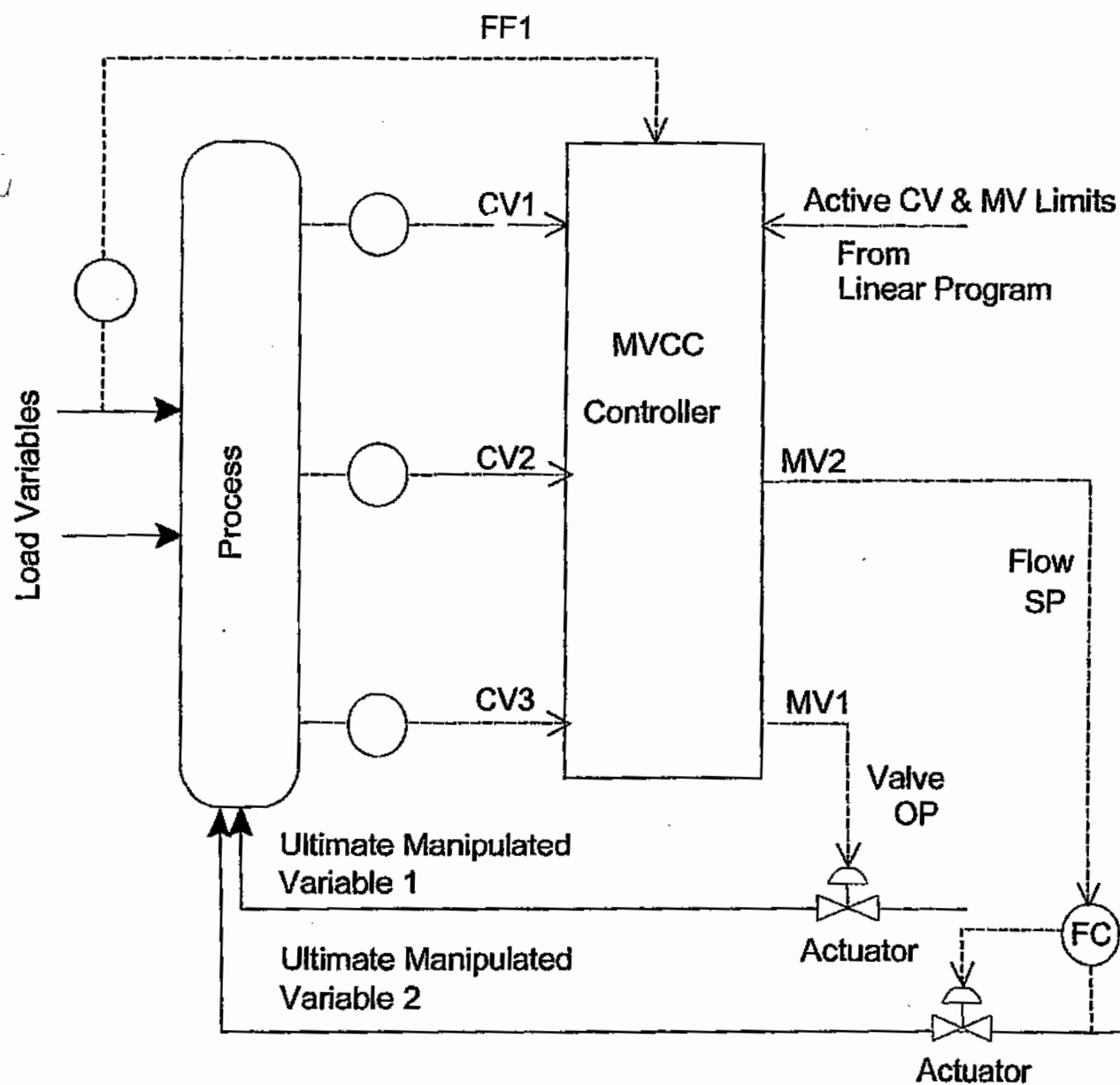


FIG. 7

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On-Line Inferential Estimate of Current Quality

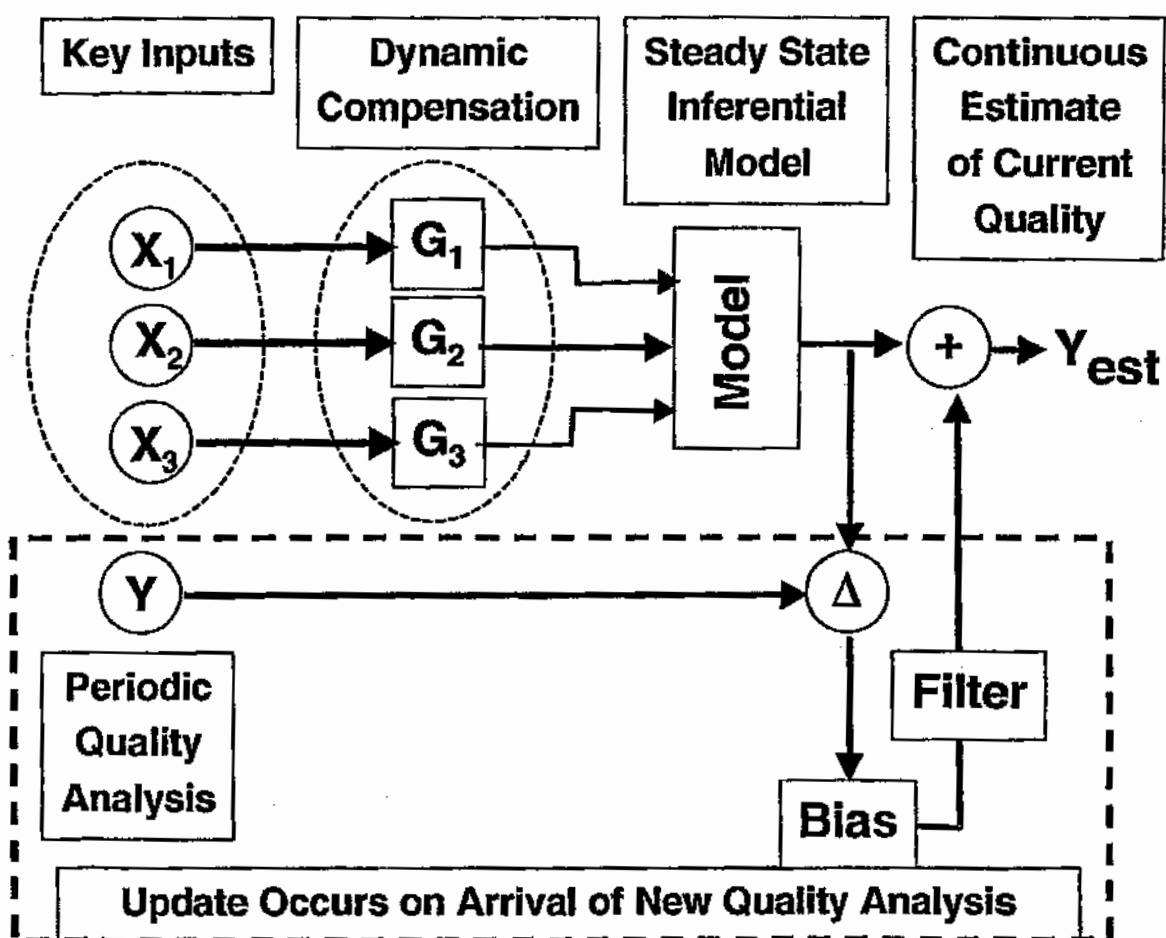
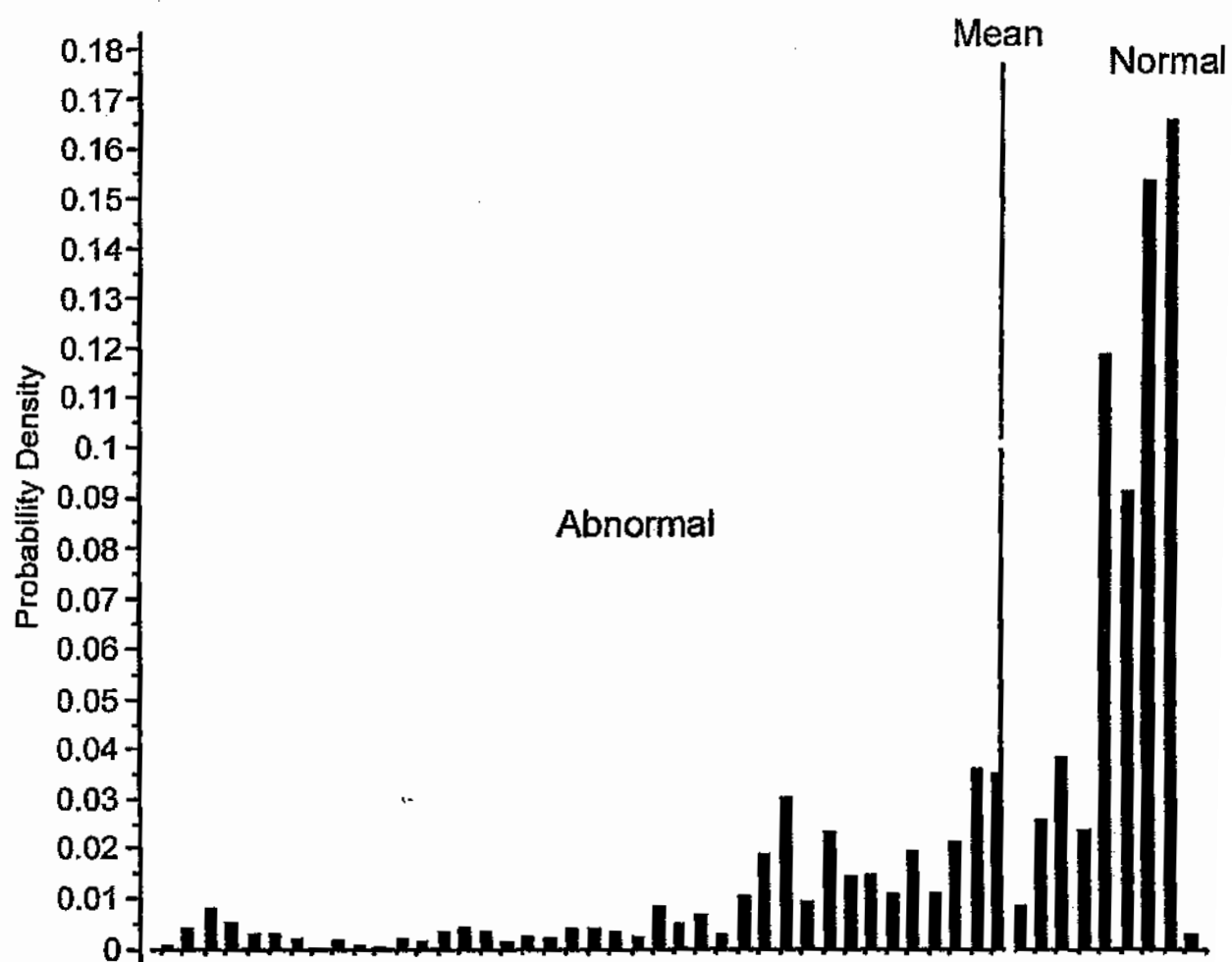


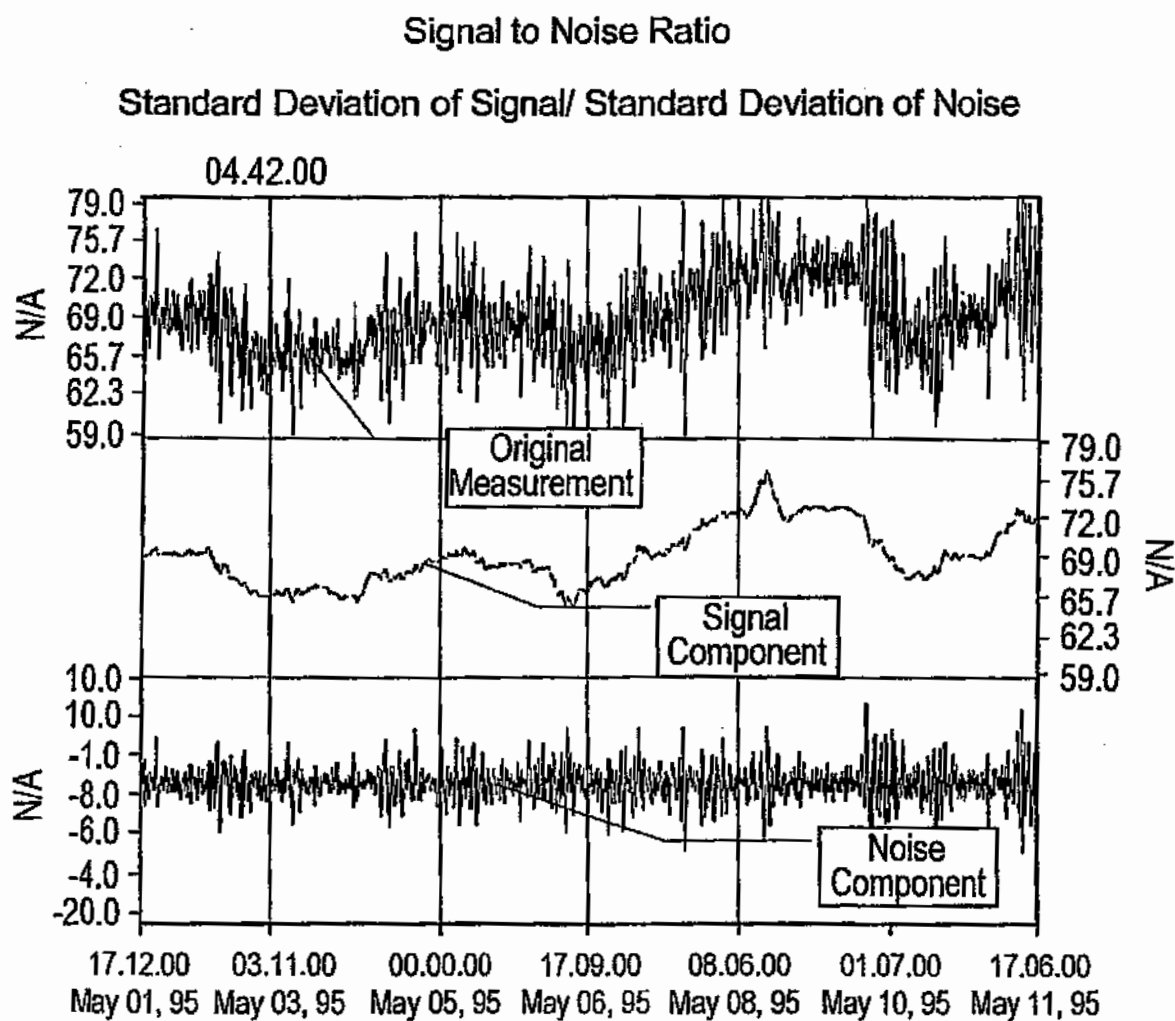
FIG. 8

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KPI Analysis of Historical Data



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**FIG. 10**

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Example of the Need for Dynamic Reconciliation

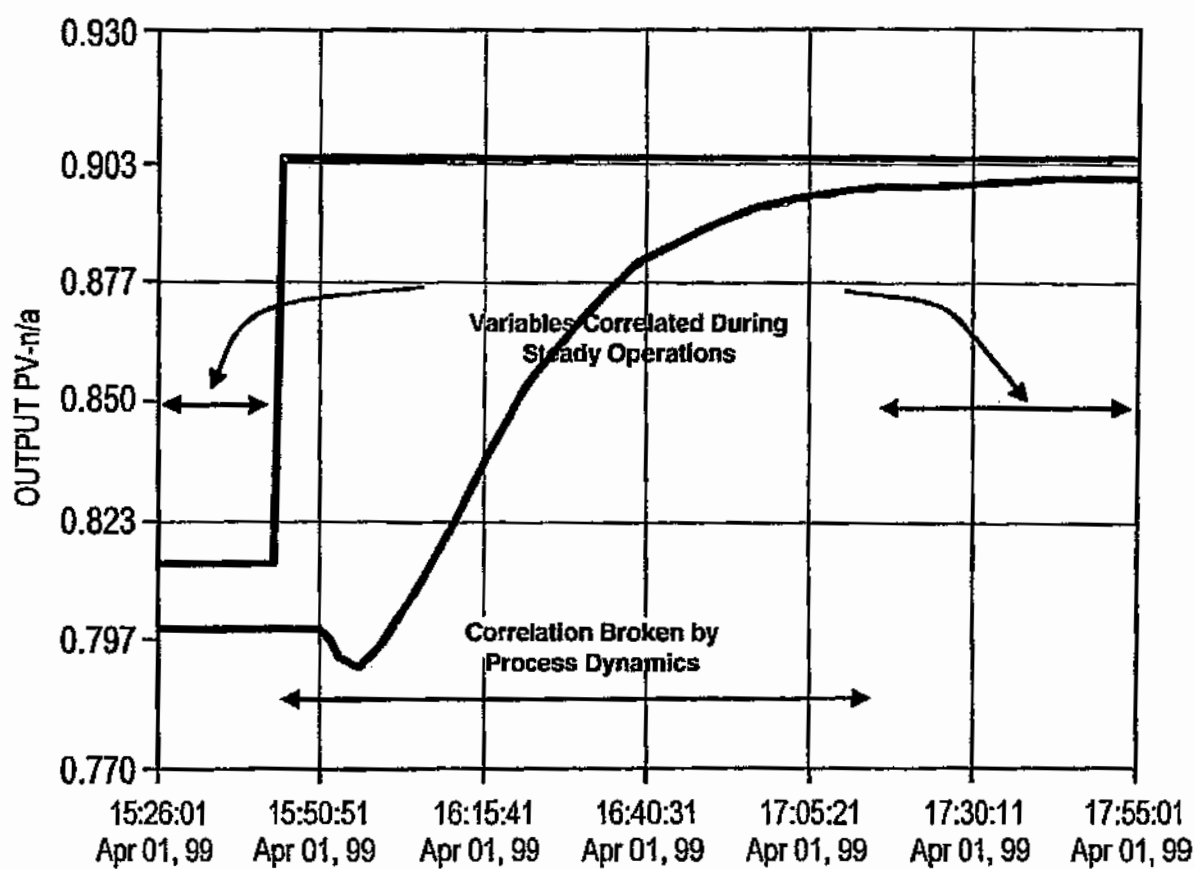
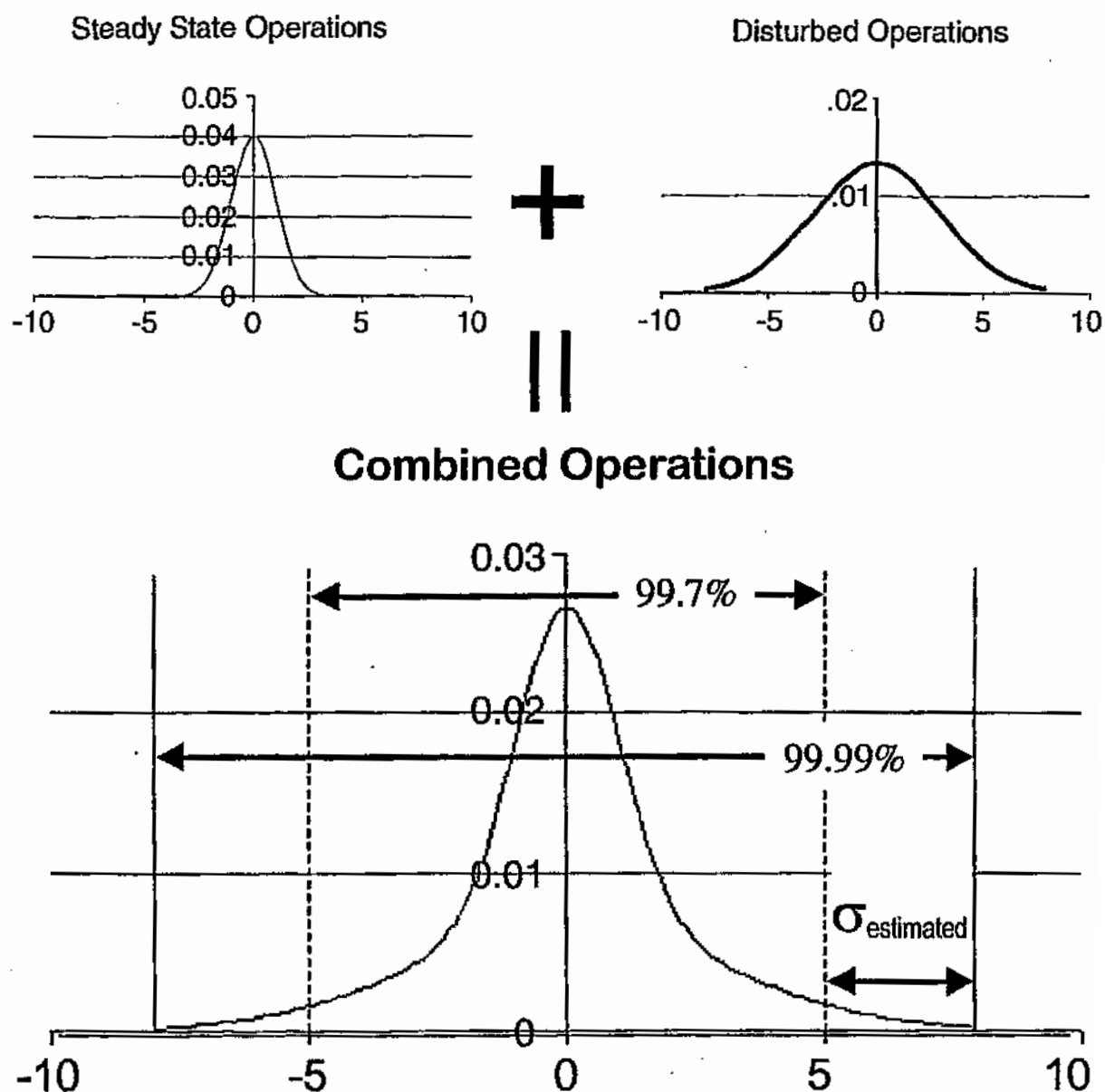


FIG. 11

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Probability Distribution of Process Data
Combined Continuous and Disturbed Operations

FIG. 12

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An Illustration of the Press Statistic

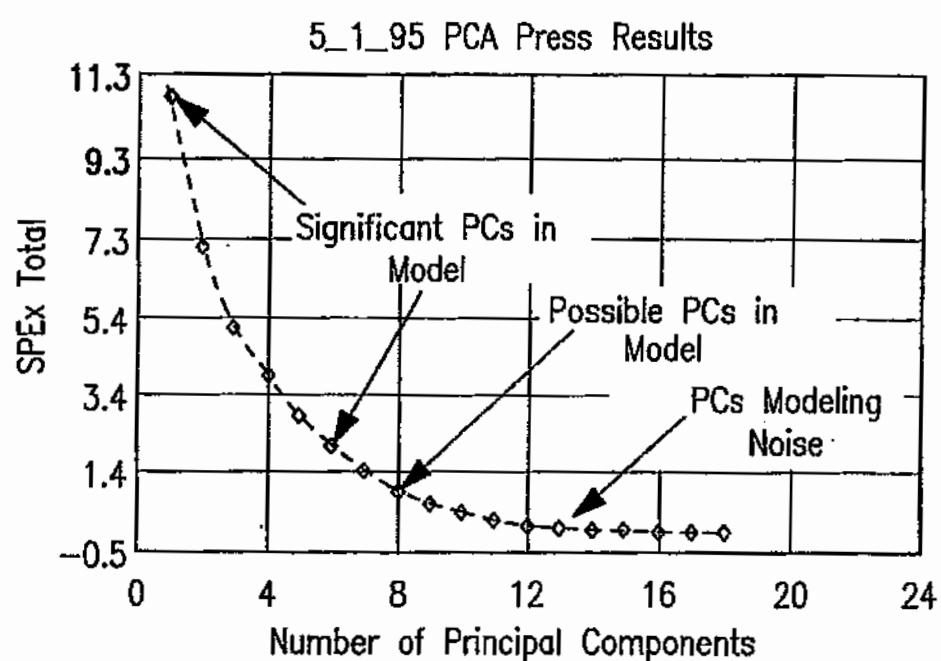


FIG. 13

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Two Dimensional Energy Balance Model

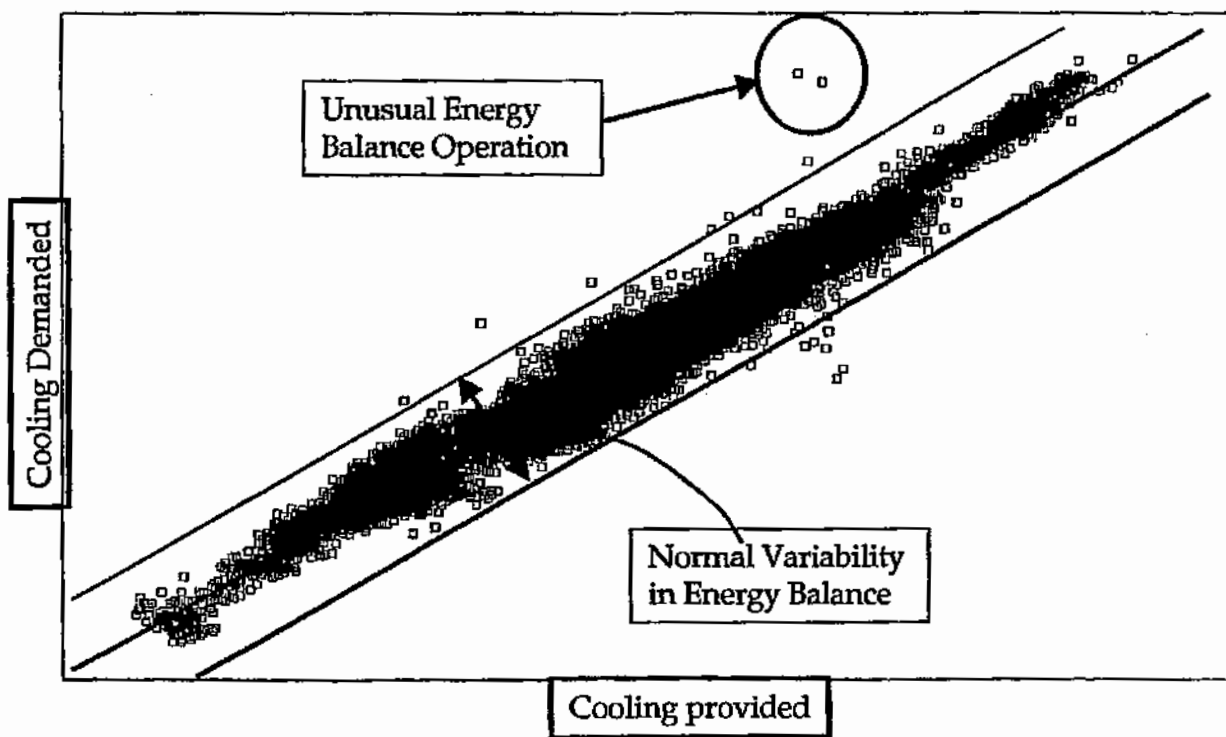


FIG. 14

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Valve to Flow Data

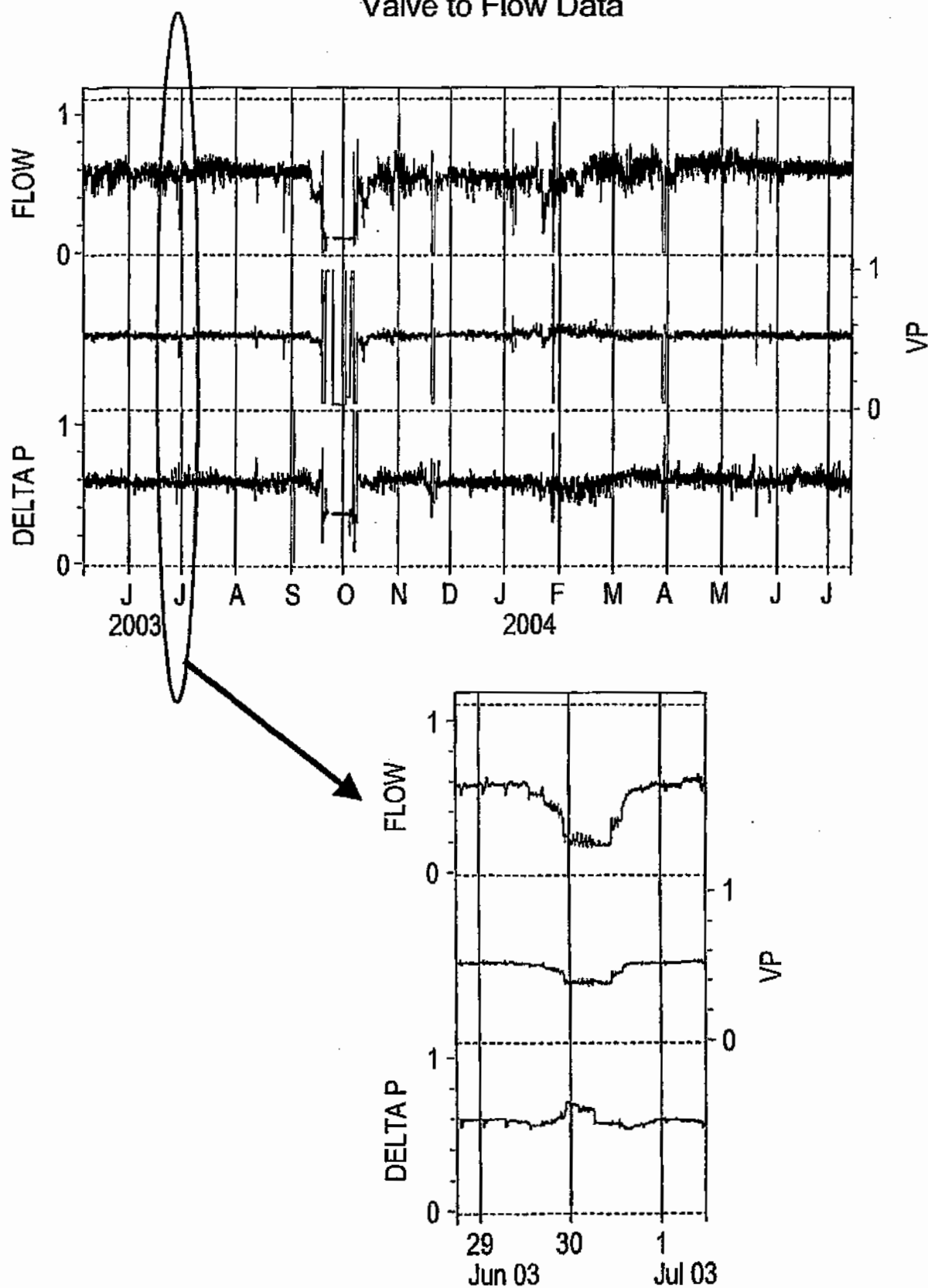


FIG. 15

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Fuzzy Discriminators

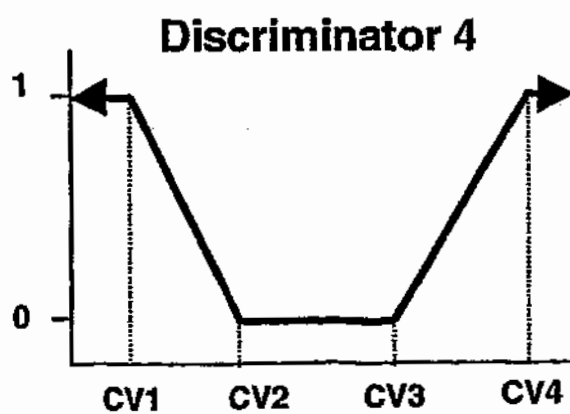
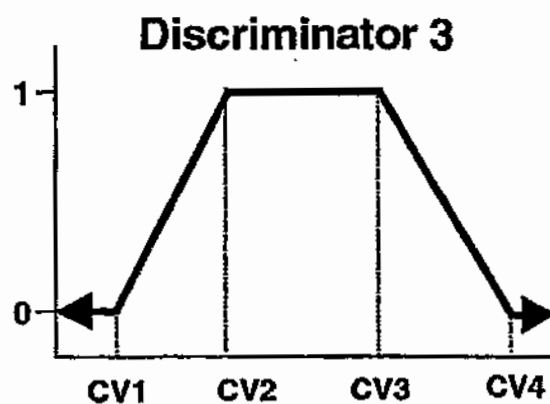
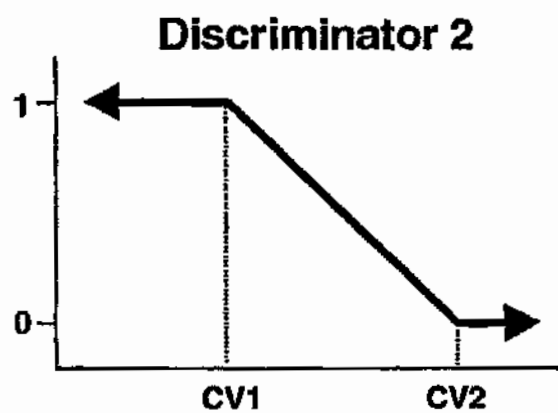
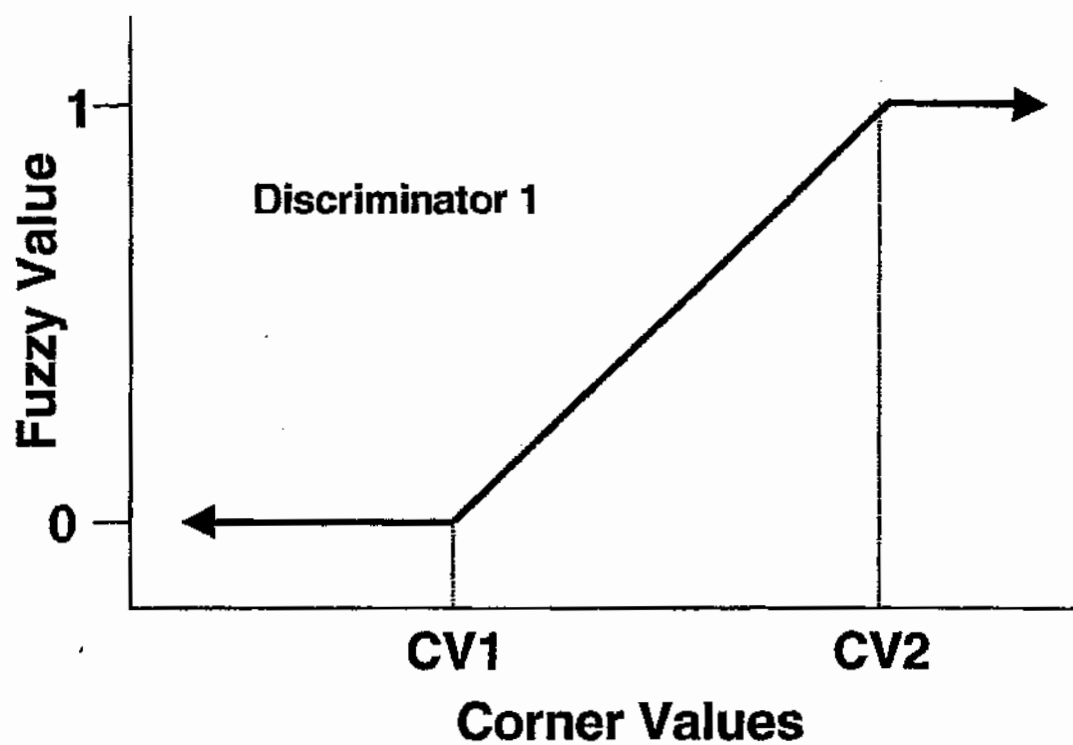


FIG. 16

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Flow versus Valve Pareto Chart

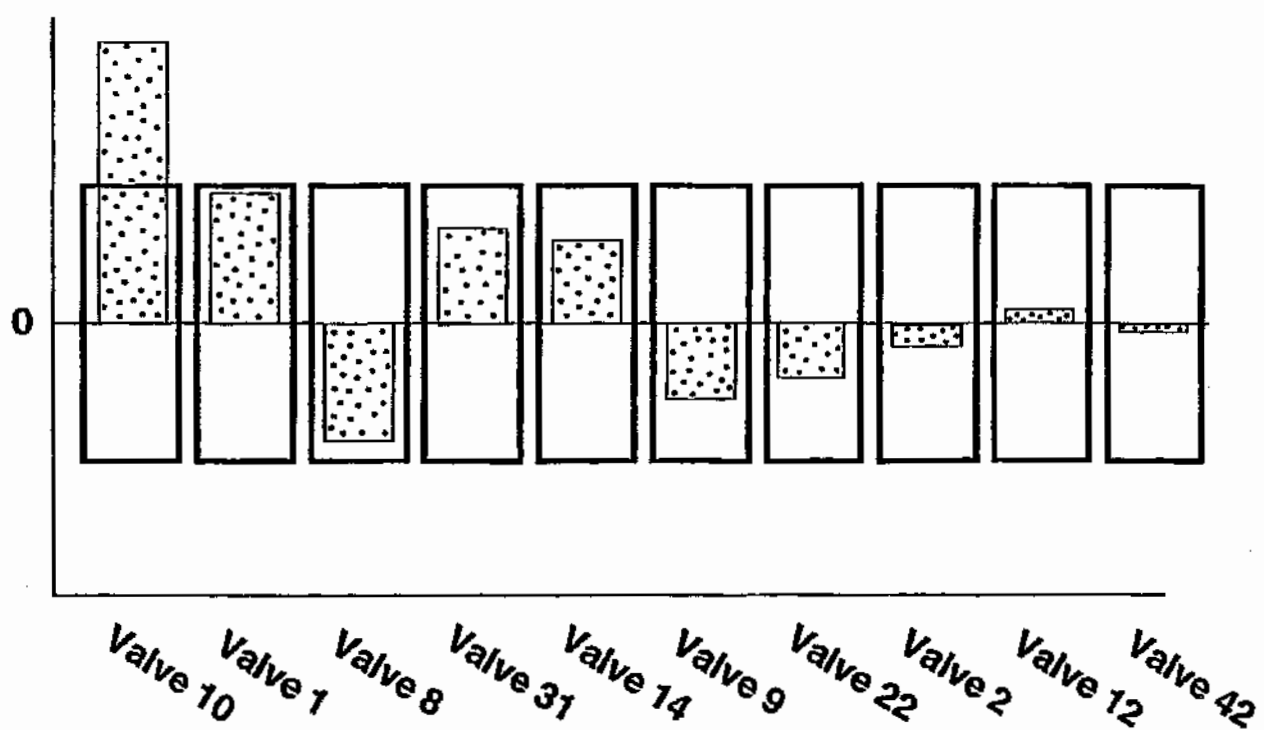


FIG. 17

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Operator Suppression Logic

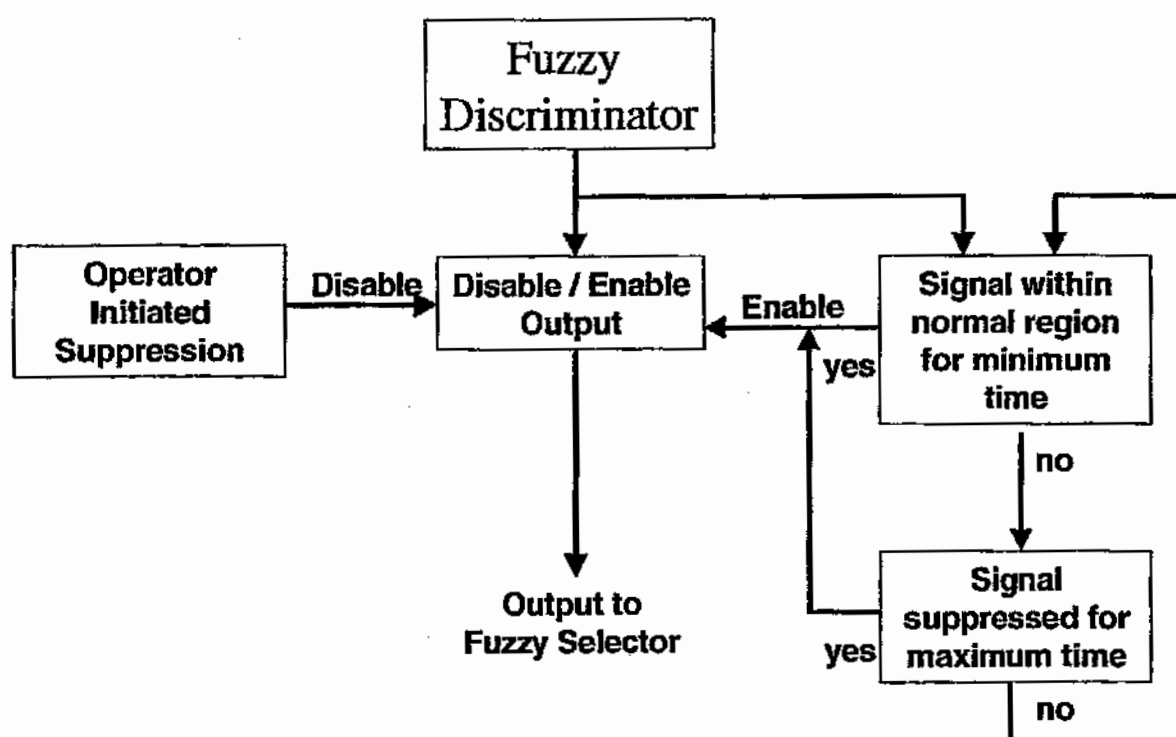


FIG. 18

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Event Suppression Logic

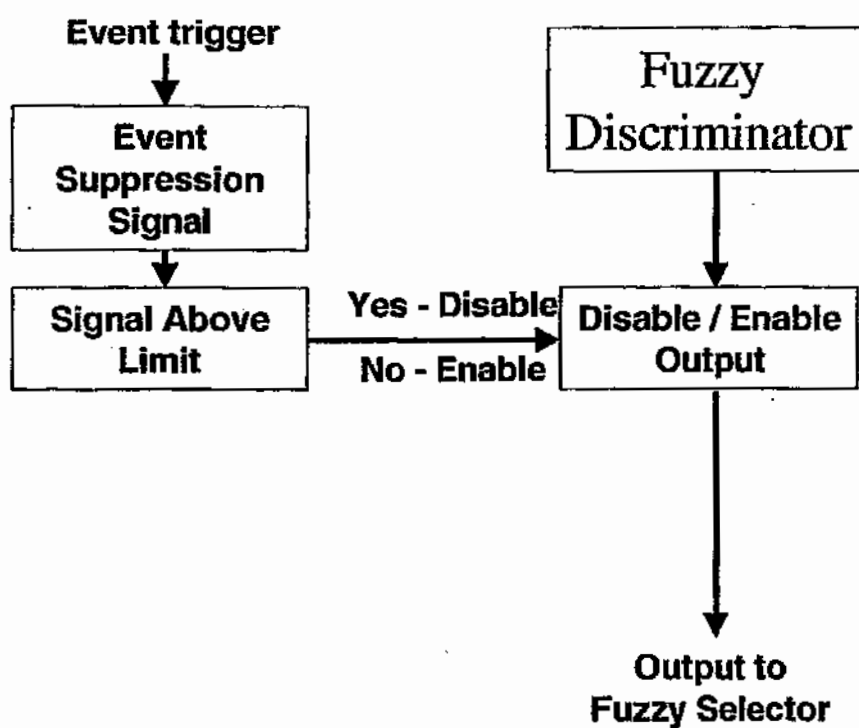


FIG. 19

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Setting the Duration of Event Suppression

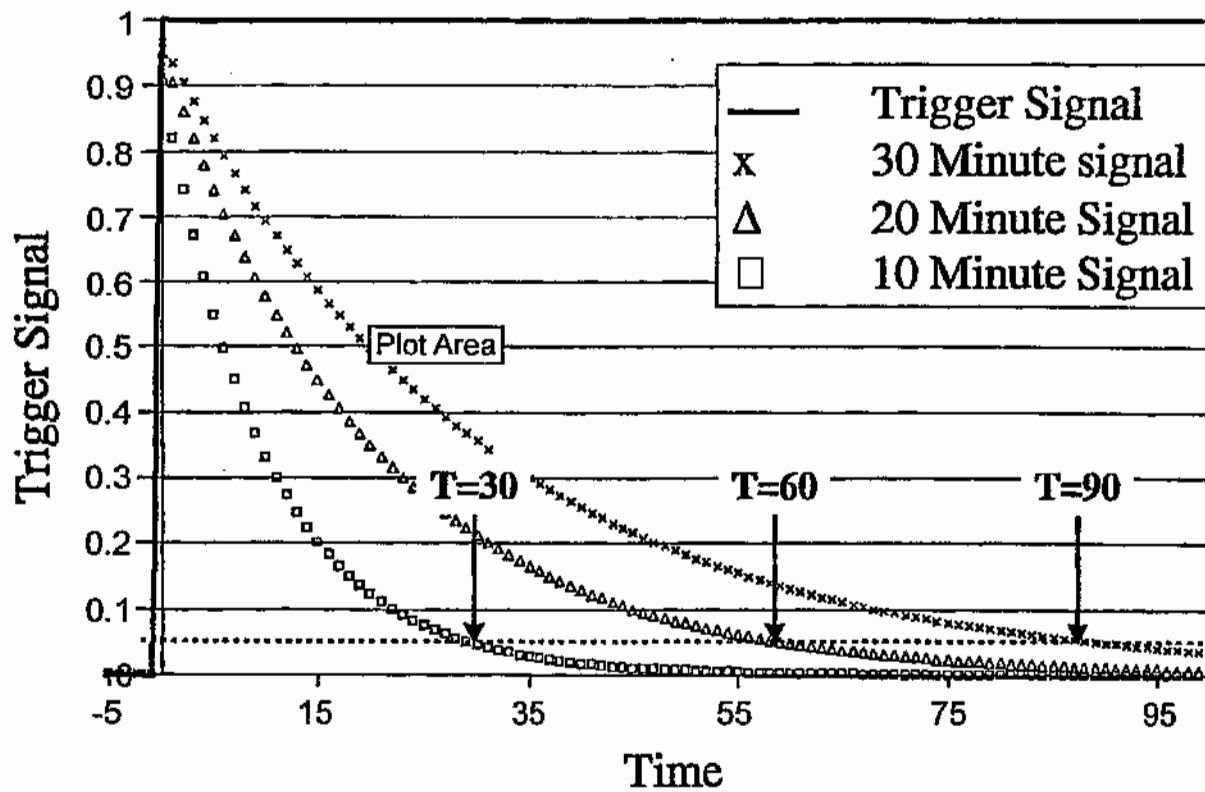


FIG. 20

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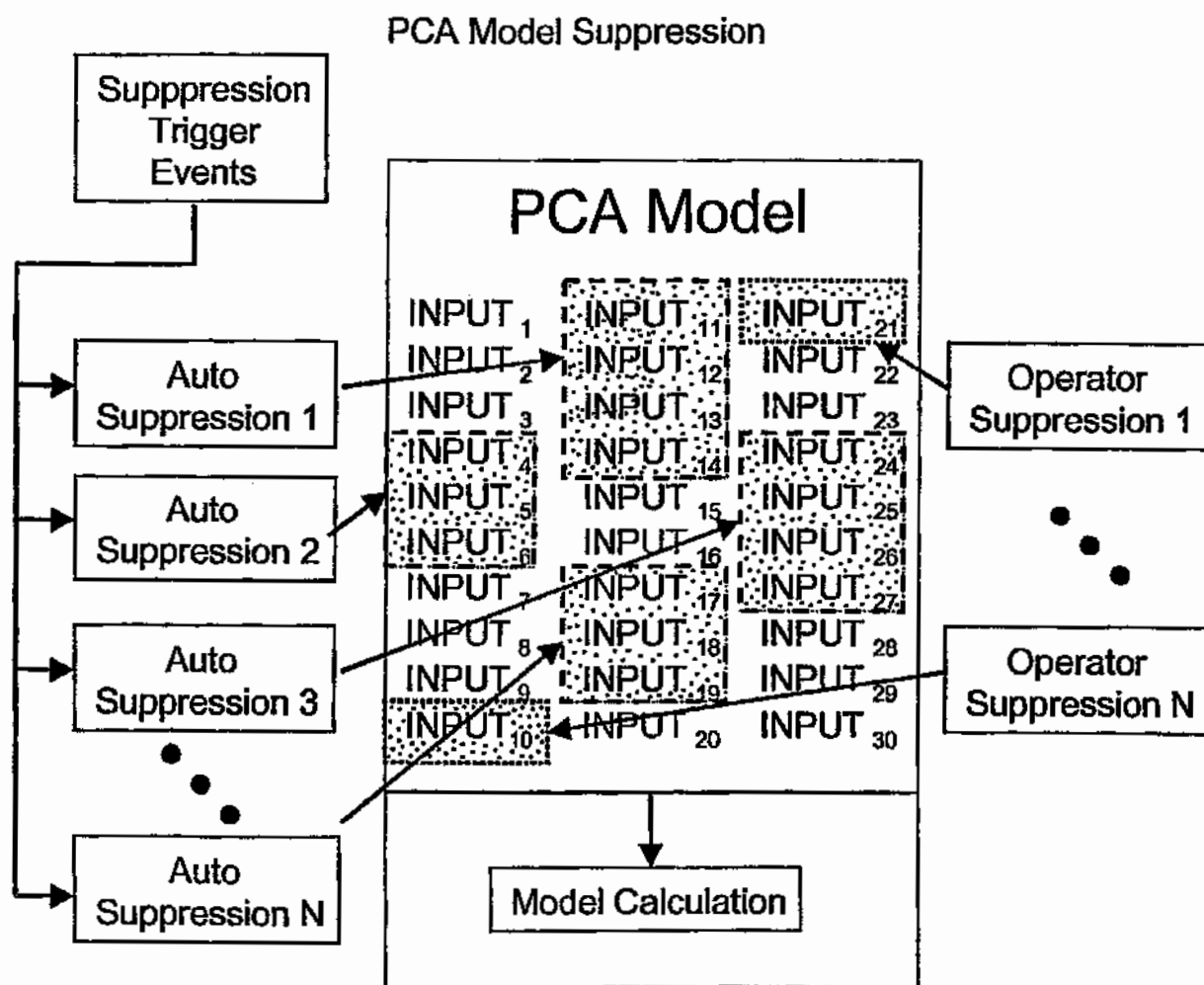


FIG. 21

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Primary Operator Interface Design

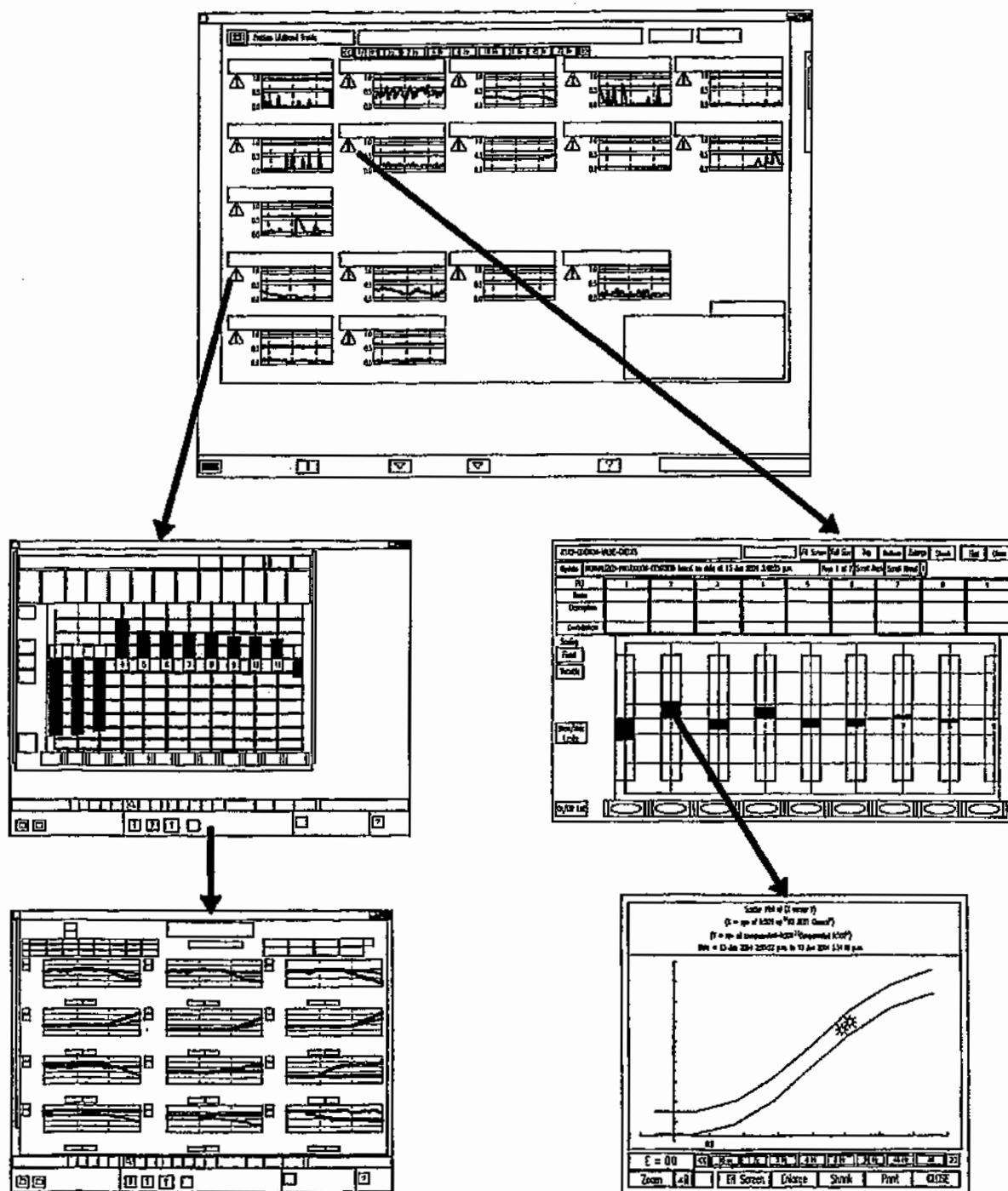


FIG. 22