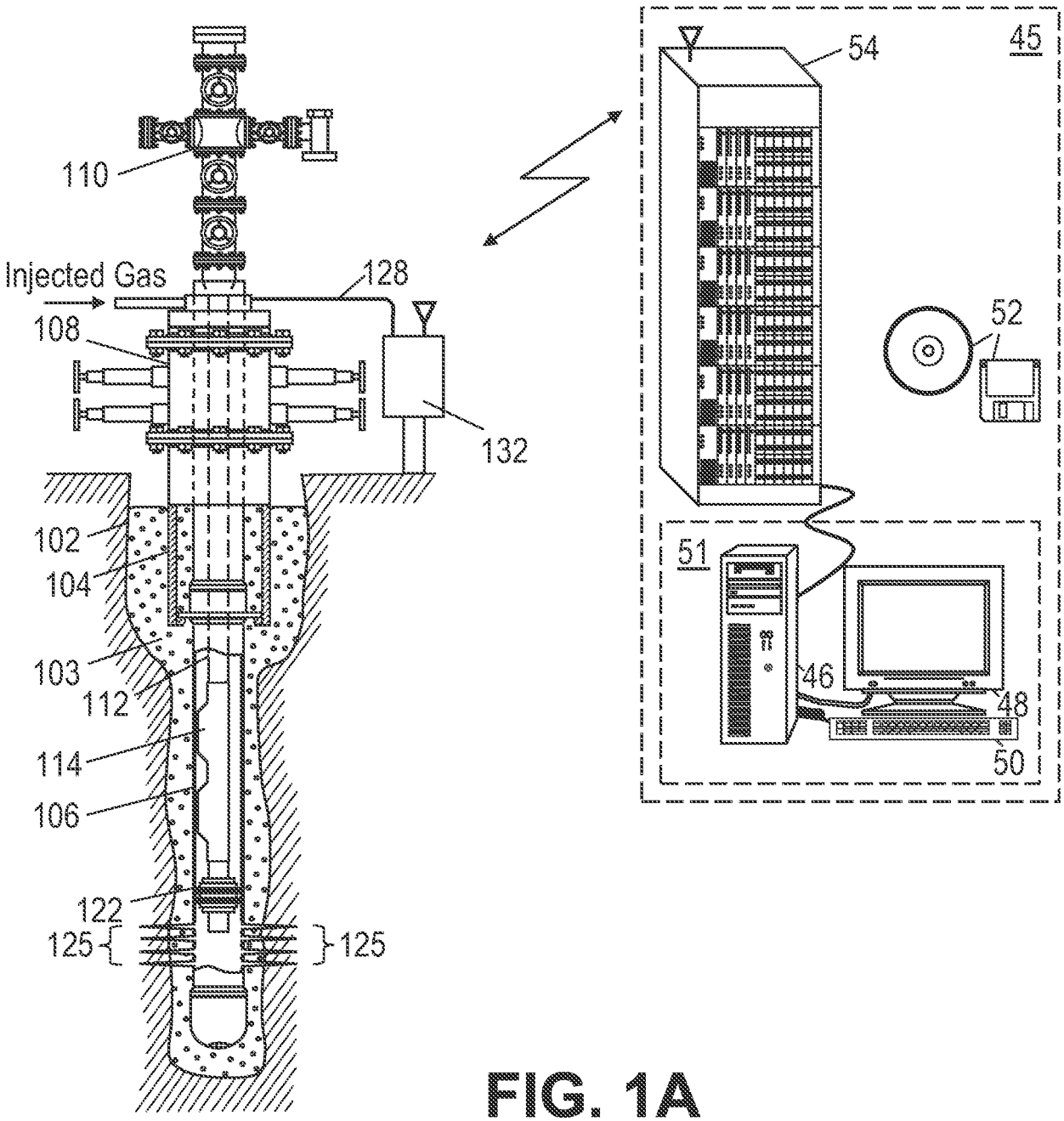

110
Injected Gas
128
108
132
102
104
103
112
114
106
122
125
125
54
45
52
51
46
48
50

FIG. 1A

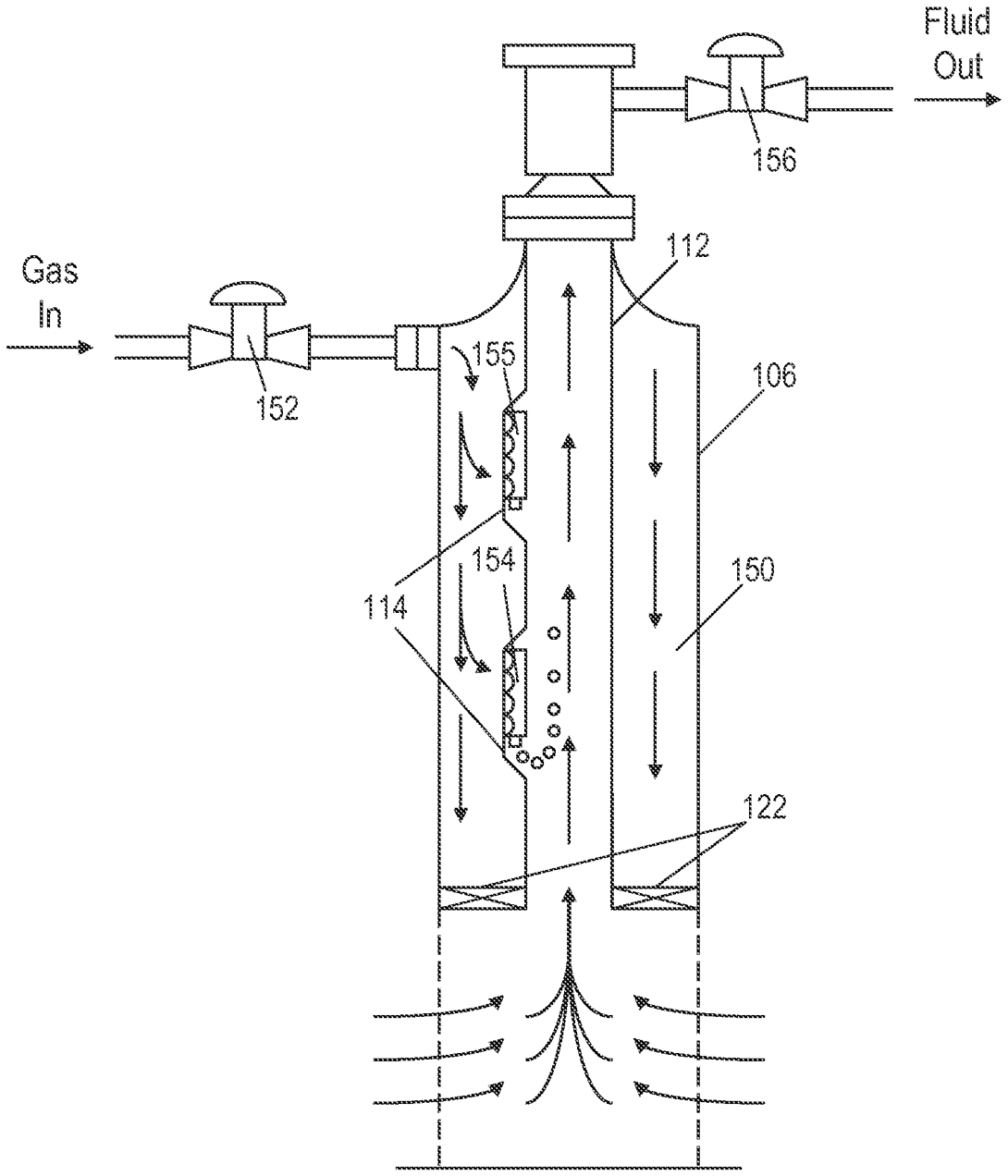


FIG. 1B

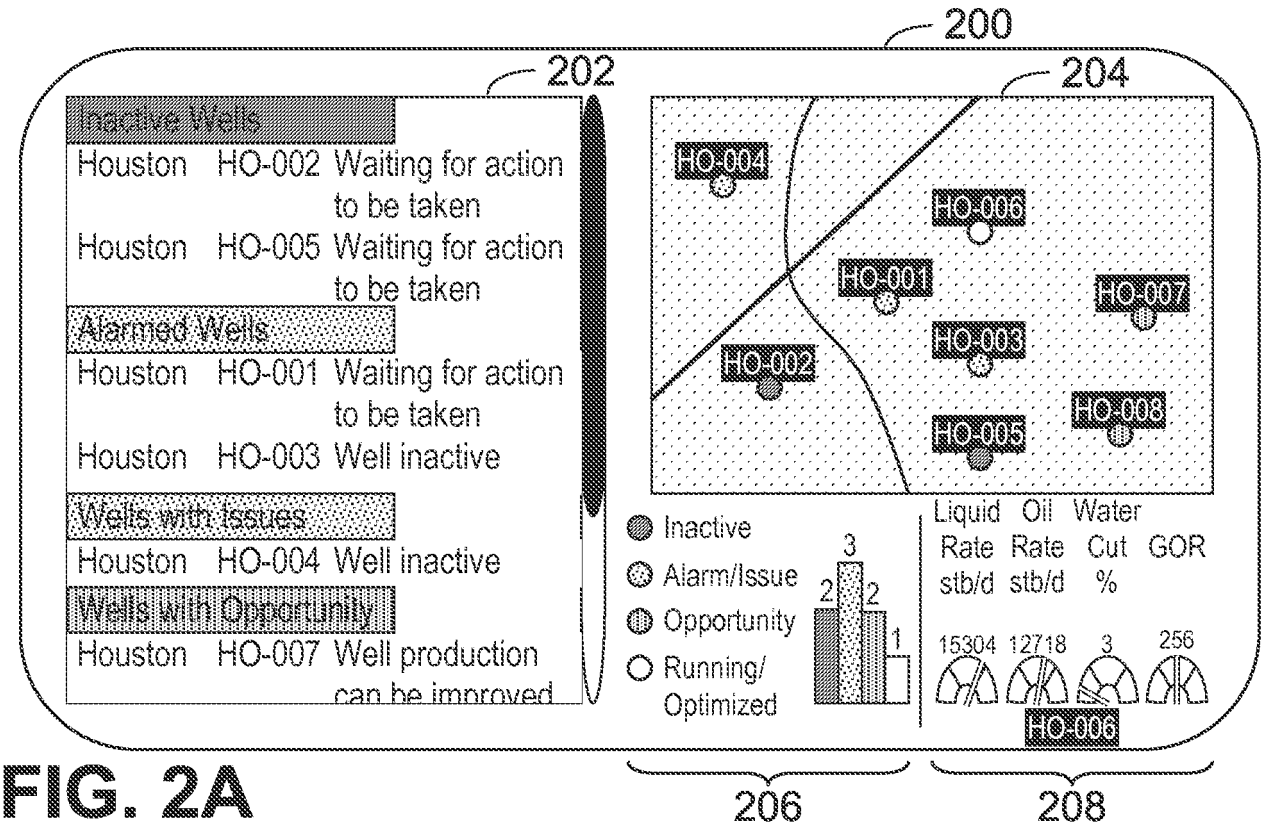
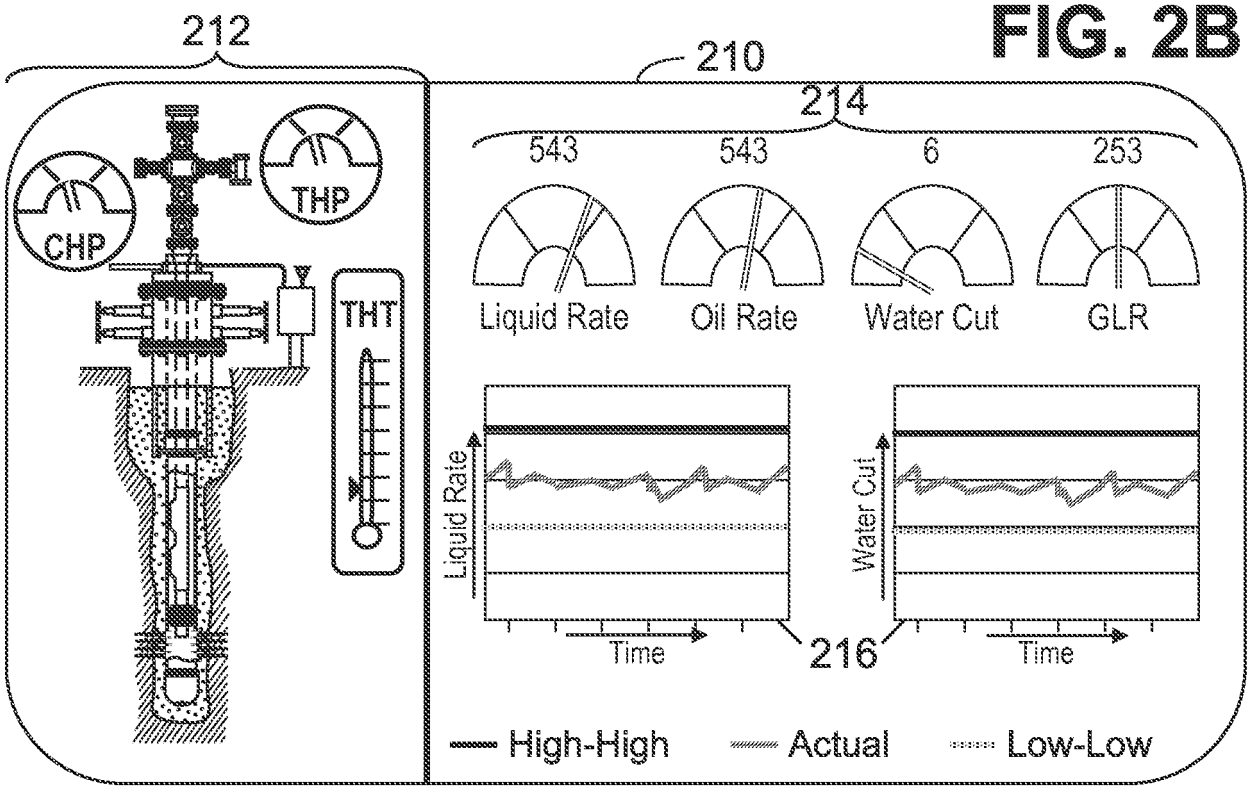

200
202
204
Inactive Wells
Houston HO-002 Waiting for action to be taken
Houston HO-005 Waiting for action to be taken
Alarmed Wells
Houston HO-001 Waiting for action to be taken
Houston HO-003 Well inactive
Wells with Issues
Houston HO-004 Well inactive
Wells with Opportunity
Houston HO-007 Well production can be improved
HO-004
HO-006
HO-001
HO-007
HO-003
HO-002
HO-008
HO-005
Inactive
Alarm/Issue
Opportunity
Running/ Optimized
3
2
2
1
Liquid Rate stb/d
Oil Rate stb/d
Water Cut %
GOR
15304
12718
3
256
HO-006
206
208

FIG. 2A

FIG. 2B


212
210
214
CHP
THP
THT
543
543
6
253
Liquid Rate
Oil Rate
Water Cut
GLR
Liquid Rate
Time
Water Cut
Time
216
High-High
Actual
Low-Low

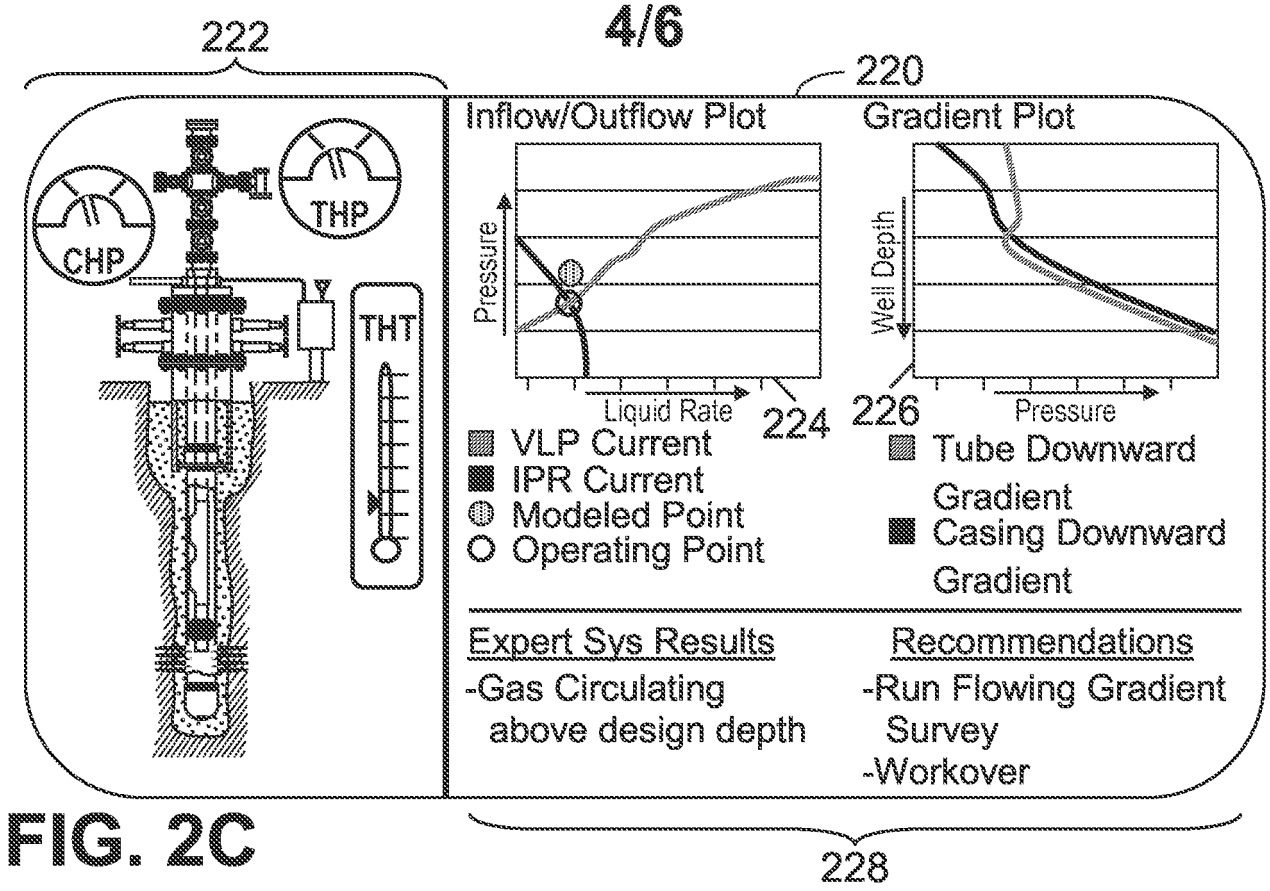

222
220
CHP
THP
THT
Inflow/Outflow Plot
Gradient Plot
Pressure
Liquid Rate
224
Well Depth
Pressure
226
VLP Current
IPR Current
Modeled Point
Operating Point
Tube Downward Gradient
Casing Downward Gradient
Expert Sys Results
-Gas Circulating above design depth
Recommendations
-Run Flowing Gradient Survey
-Workover
228

FIG. 2C

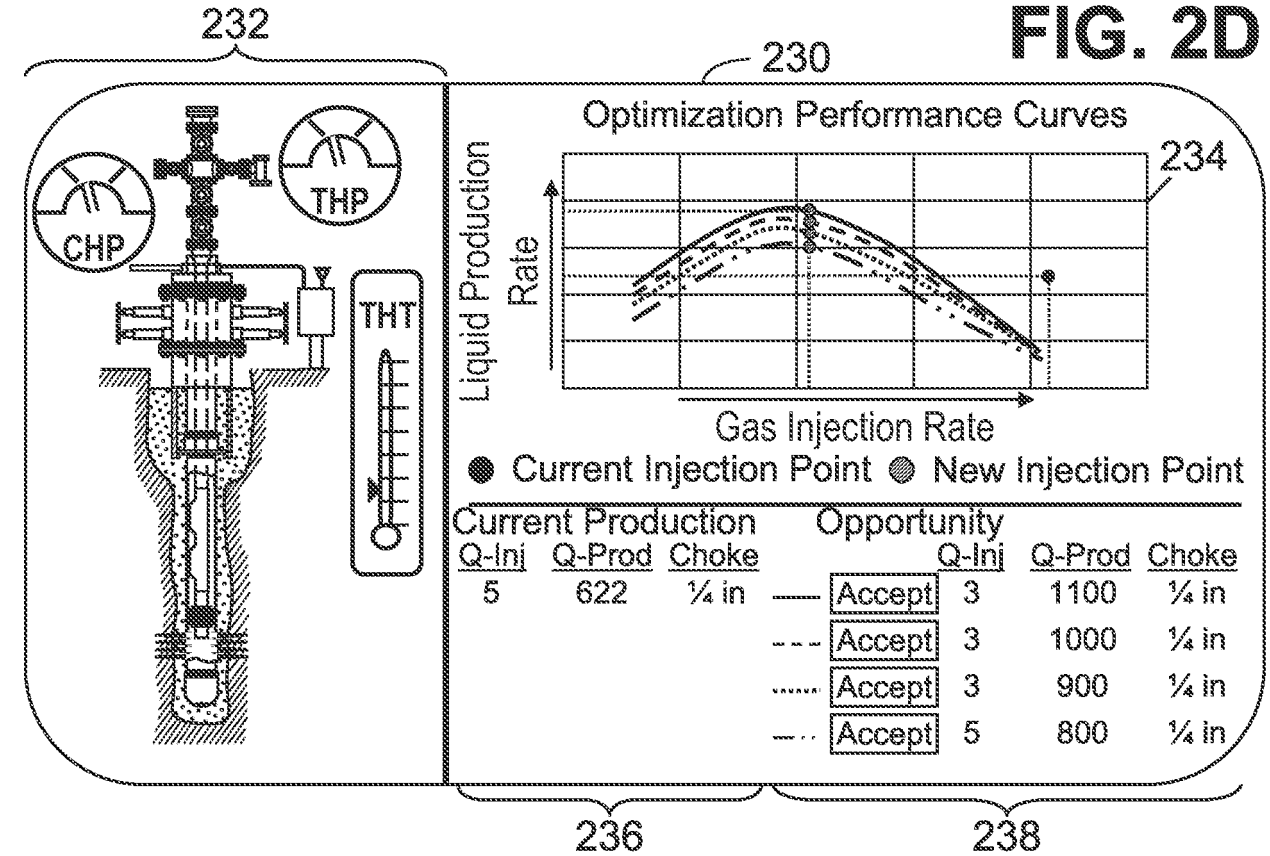

232
230
CHP
THP
THT
Optimization Performance Curves
234
Liquid Production Rate
Gas Injection Rate
Current Injection Point
New Injection Point
Current Production
Q-Inj 5
Q-Prod 622
Choke ¼ in
Opportunity
Q-Inj Q-Prod Choke
Accept 3 1100 ¼ in
Accept 3 1000 ¼ in
Accept 3 900 ¼ in
Accept 5 800 ¼ in
236
238

FIG. 2D

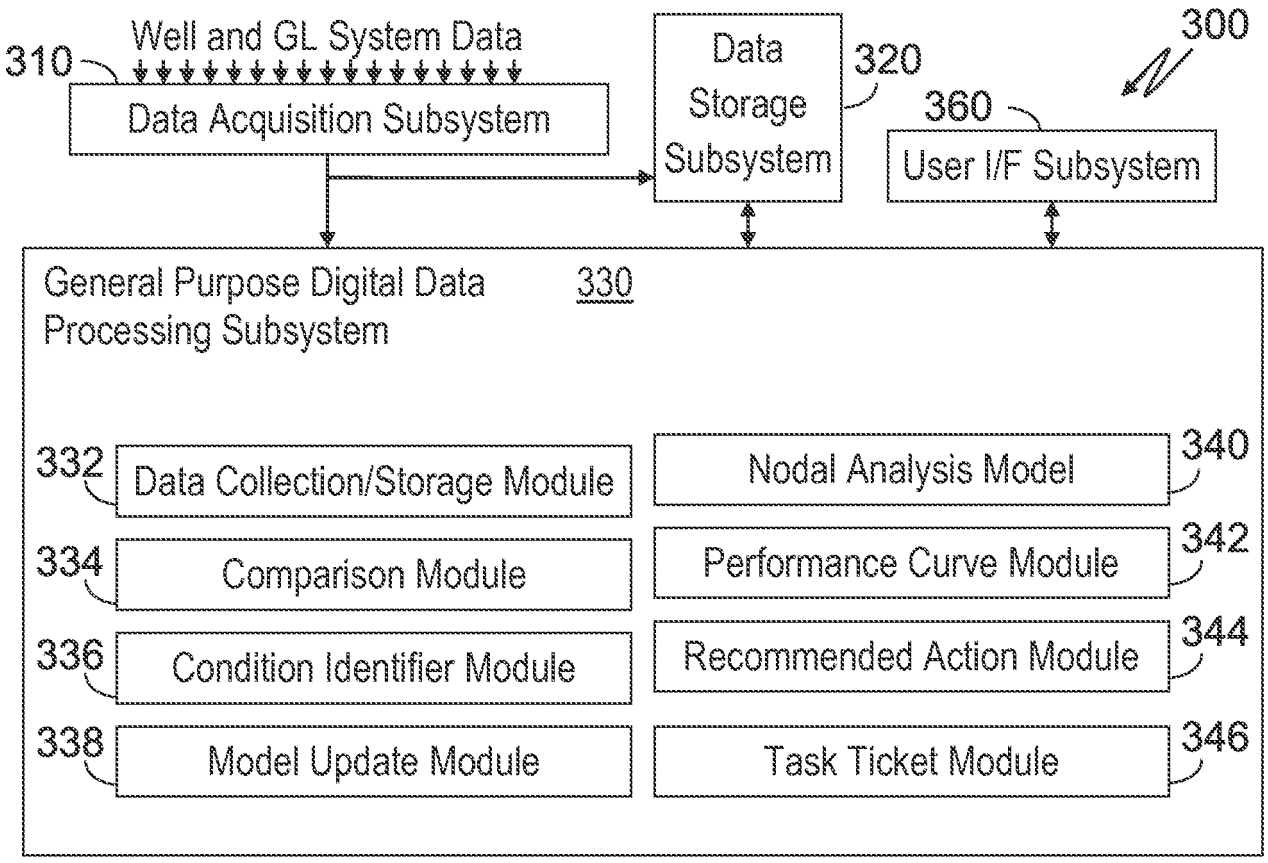

Well and GL System Data
310
Data Acquisition Subsystem
Data Storage Subsystem
320
300
360
User I/F Subsystem
General Purpose Digital Data Processing Subsystem
330
332
Data Collection/Storage Module
334
Comparison Module
336
Condition Identifier Module
338
Model Update Module
Nodal Analysis Model
340
Performance Curve Module
342
Recommended Action Module
344
Task Ticket Module
346

FIG. 3

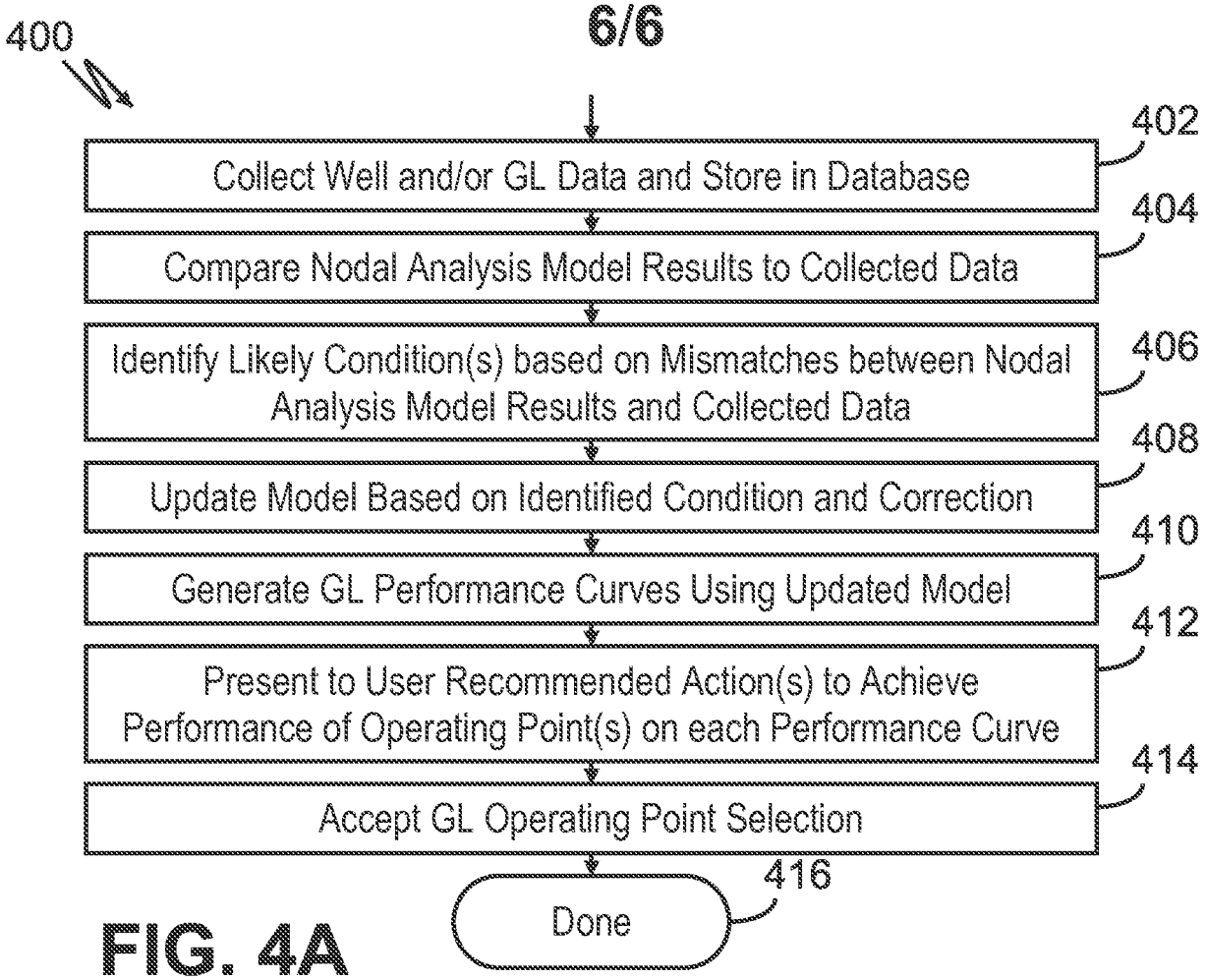

400
Collect Well and/or GL Data and Store in Database
402
Compare Nodal Analysis Model Results to Collected Data
404
Identify Likely Condition(s) based on Mismatches between Nodal Analysis Model Results and Collected Data
406
Update Model Based on Identified Condition and Correction
408
Generate GL Performance Curves Using Updated Model
410
Present to User Recommended Action(s) to Achieve Performance of Operating Point(s) on each Performance Curve
412
Accept GL Operating Point Selection
414
Done
416

FIG. 4A

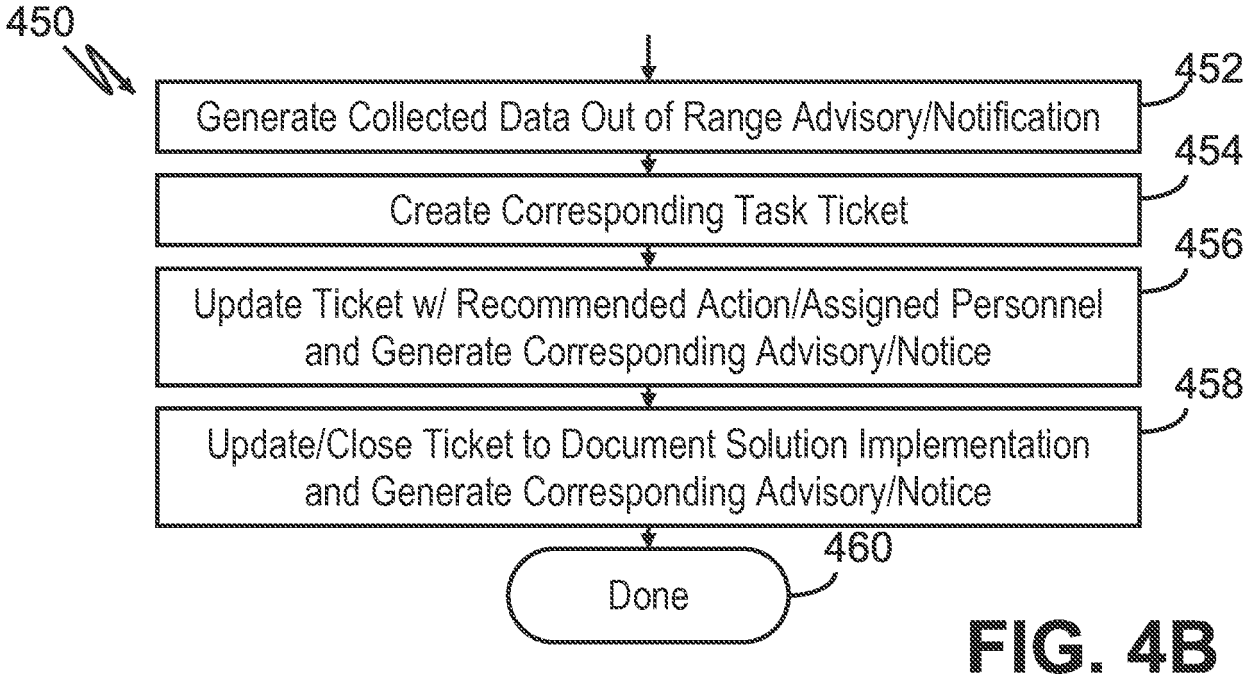

450
Generate Collected Data Out of Range Advisory/Notification
452
Create Corresponding Task Ticket
454
Update Ticket w/ Recommended Action/Assigned Personnel and Generate Corresponding Advisory/Notice
456
Update/Close Ticket to Document Solution Implementation and Generate Corresponding Advisory/Notice
458
Done
460

FIG. 4B