MP 608 – Marshall, Michigan Incident
NTSB/PHMSA Information Request No. 108

108 **Reference:** Email request by Matt Nicholson of November 9, 2010

Preamble:

Request: Submit the flow chart (referenced by Shane during interviews) used by the mass balance analyst in reviewing 5-min, 20-min and 2-hr mass balance alarms that define how he/she follows through with the alarm.

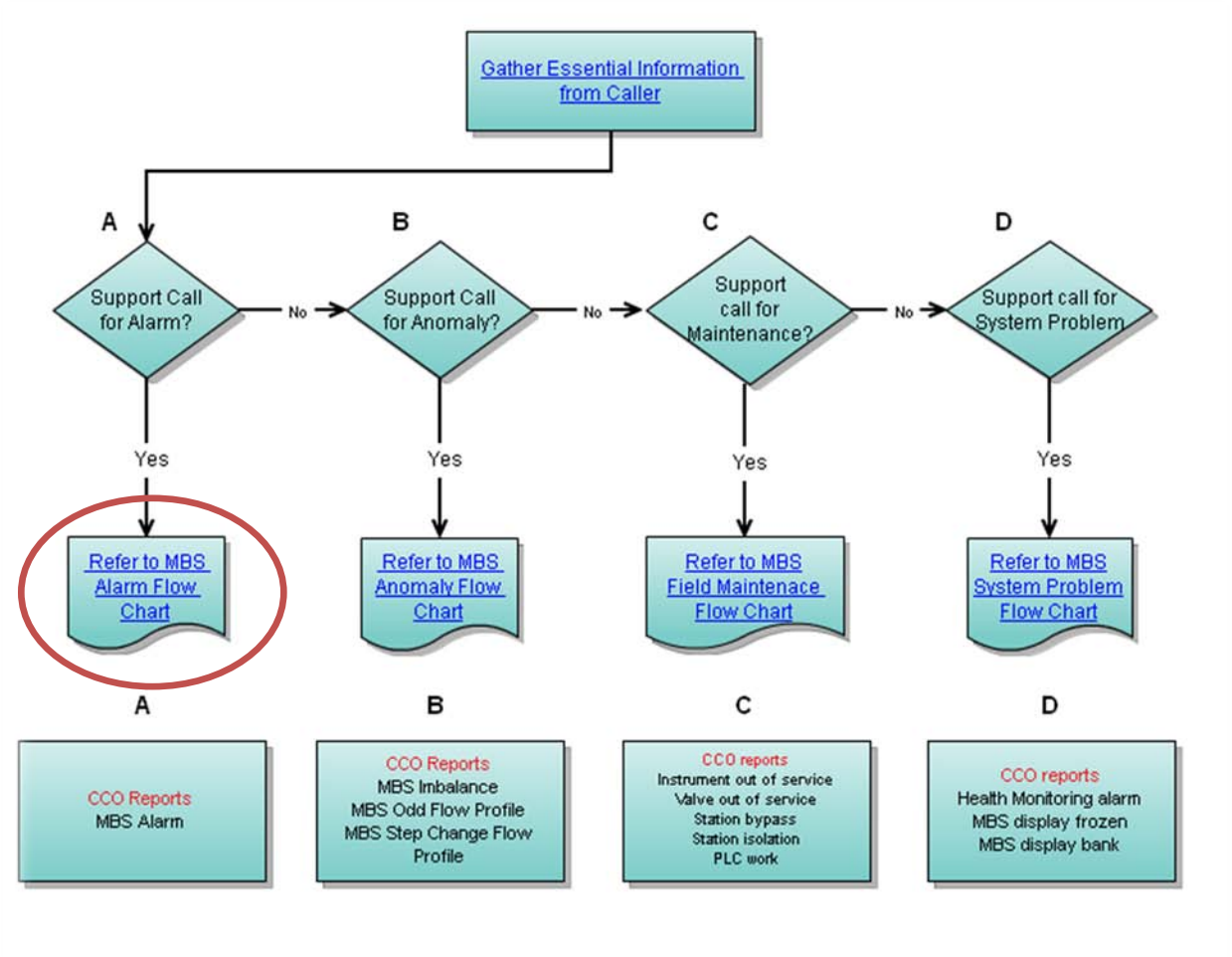
Requested by November 26, 2010

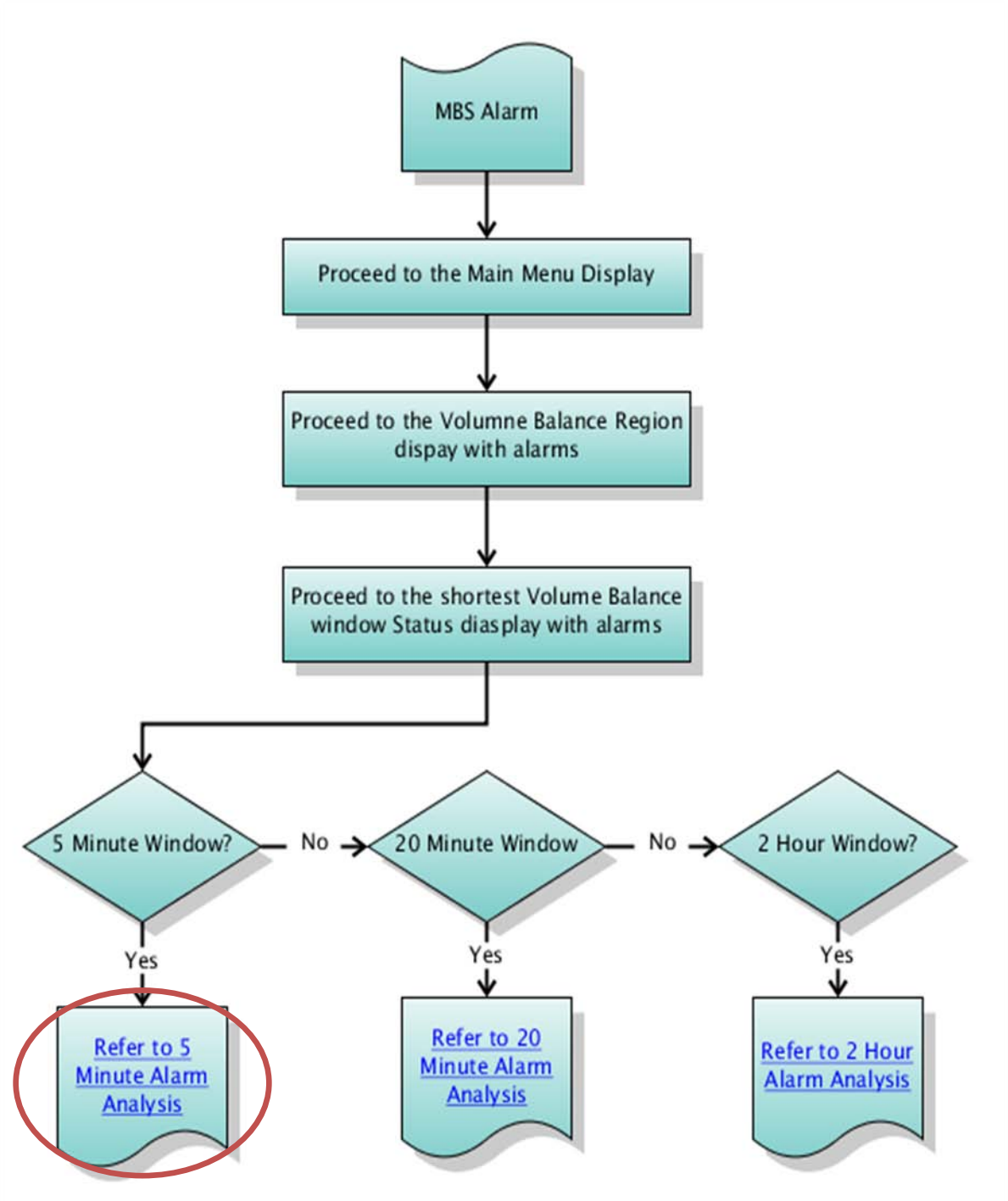
Response: The MBS support response flow chart can be used when handling all MBS situations reported to the analyst, including issues with the MBS system, scheduled or unscheduled field work, alarms, and anomalies.

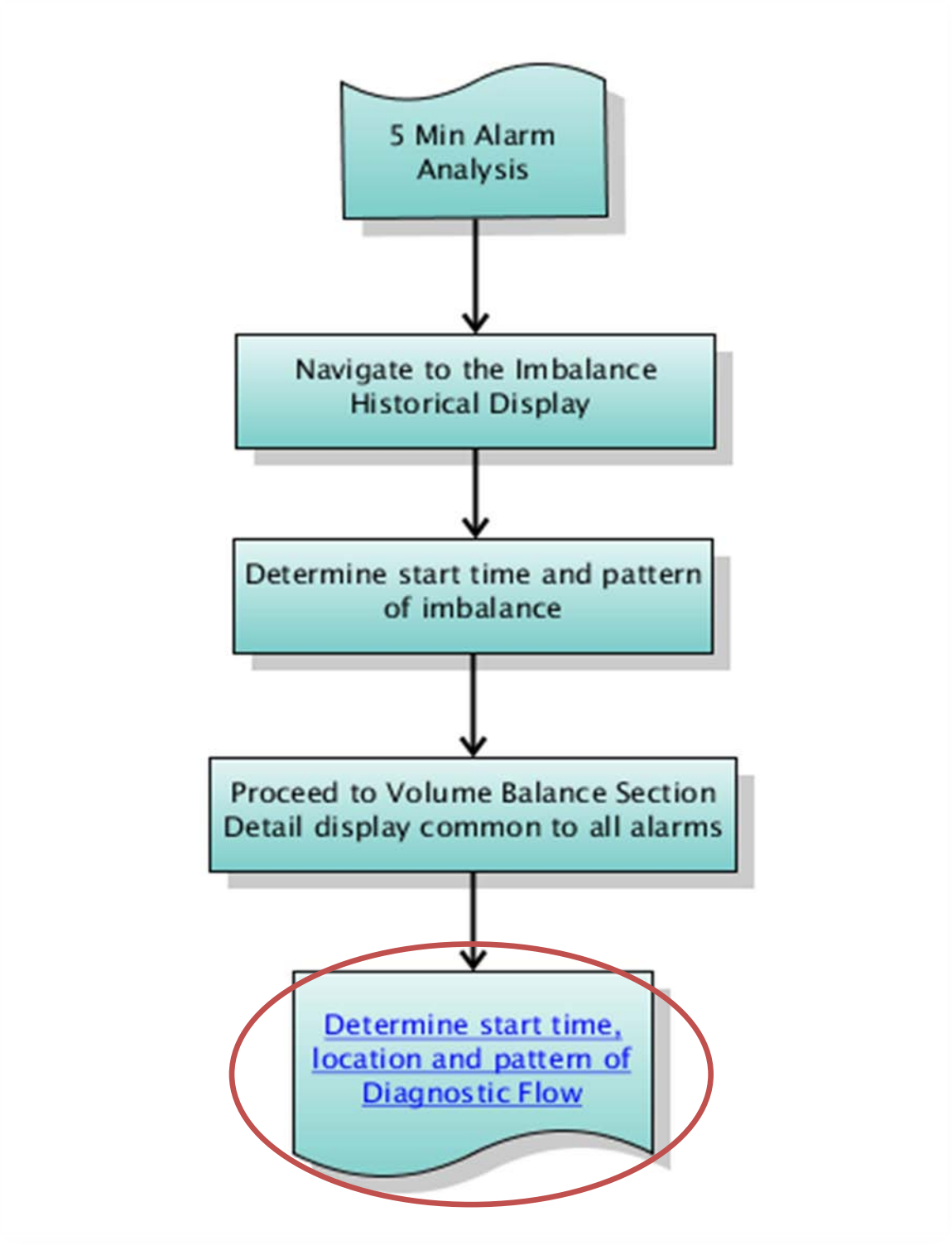
The following are three separate examples of how the flow chart can be used;

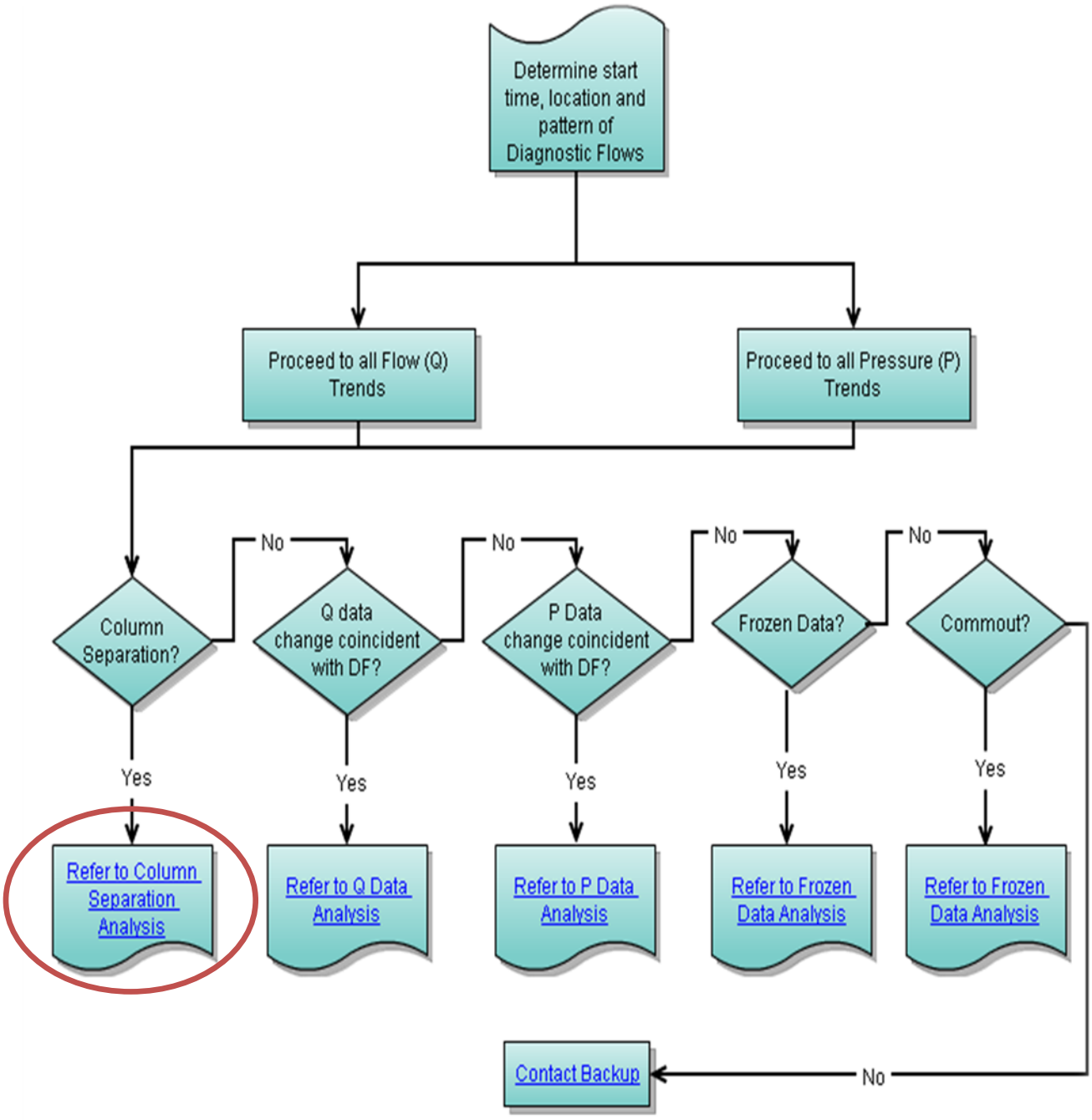
1) In response to a 5-min MBS alarm related to column separation.
2) In response to a 20-min MBS alarm related to a frozen pressure transmitter.
3) In response to a field maintenance call. Flow meter to be taken out of service for repairs.

1) Using the flow chart to respond to a 5-min MBS alarm related to column separation.

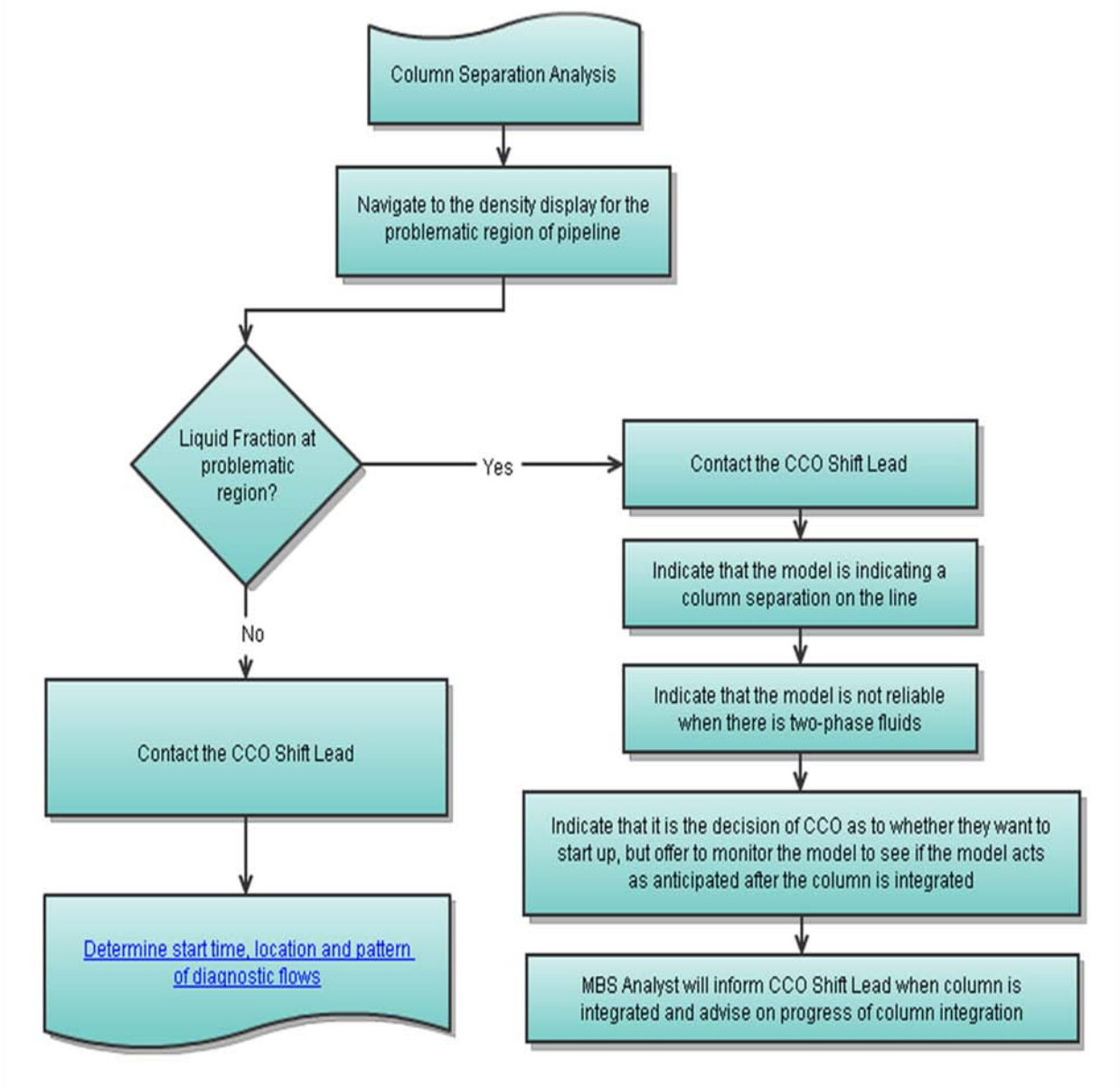



MBS Alarm
Proceed to the Main Menu Display
Proceed to the Volumne Balance Region dispay with alarms
Proceed to the shortest Volume Balance window Status diasplay with alarms
5 Minute Window?
No
20 Minute Window
No
2 Hour Window?
Yes
Yes
Yes
Refer to 5 Minute Alarm Analysis
Refer to 20 Minute Alarm Analysis
Refer to 2 Hour Alarm Analysis

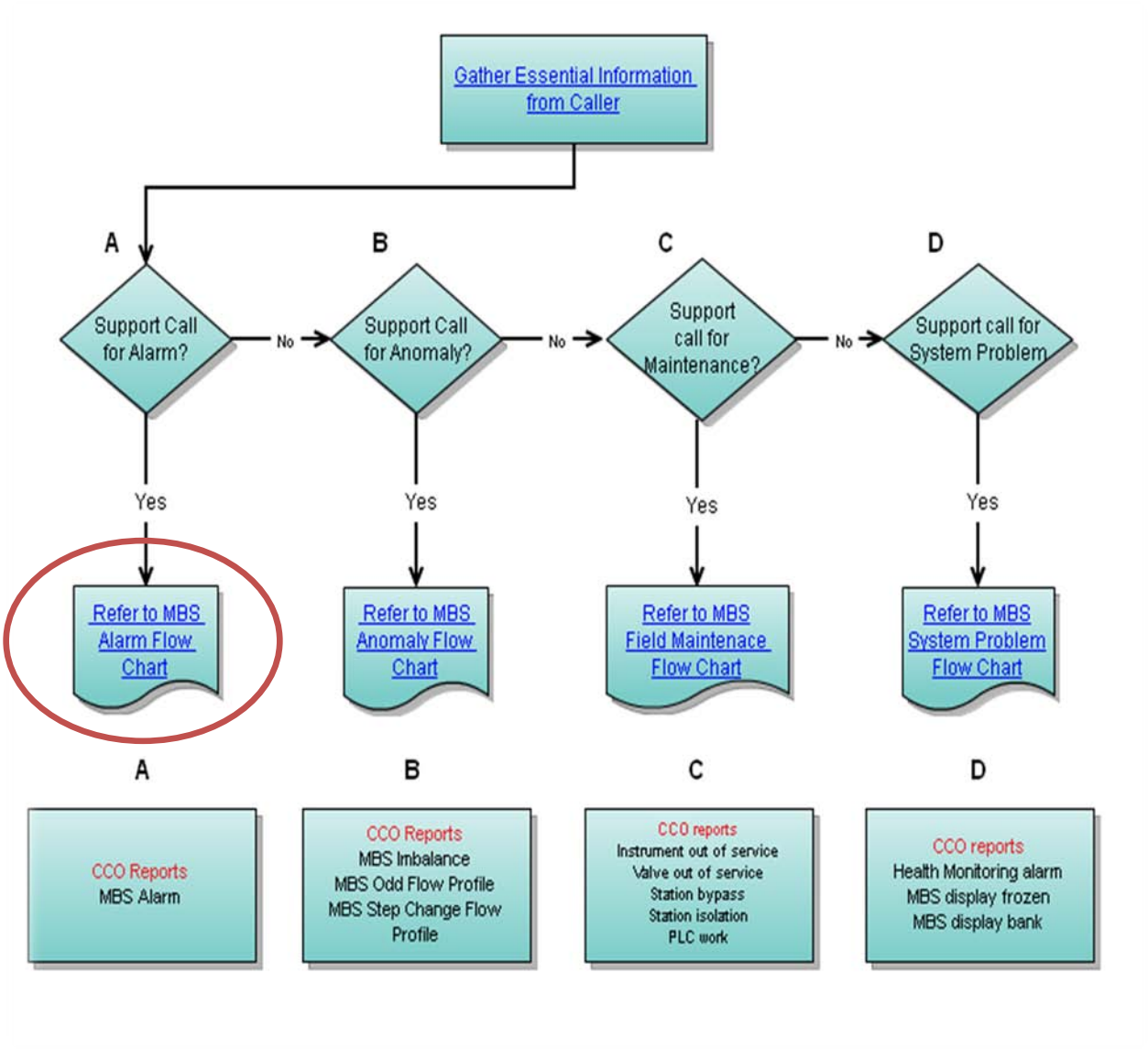

5 Min Alarm Analysis
Navigate to the Imbalance Historical Display
Determine start time and pattern of imbalance
Proceed to Volume Balance Section Detail display common to all alarms
Determine start time, location and pattern of Diagnostic Flow

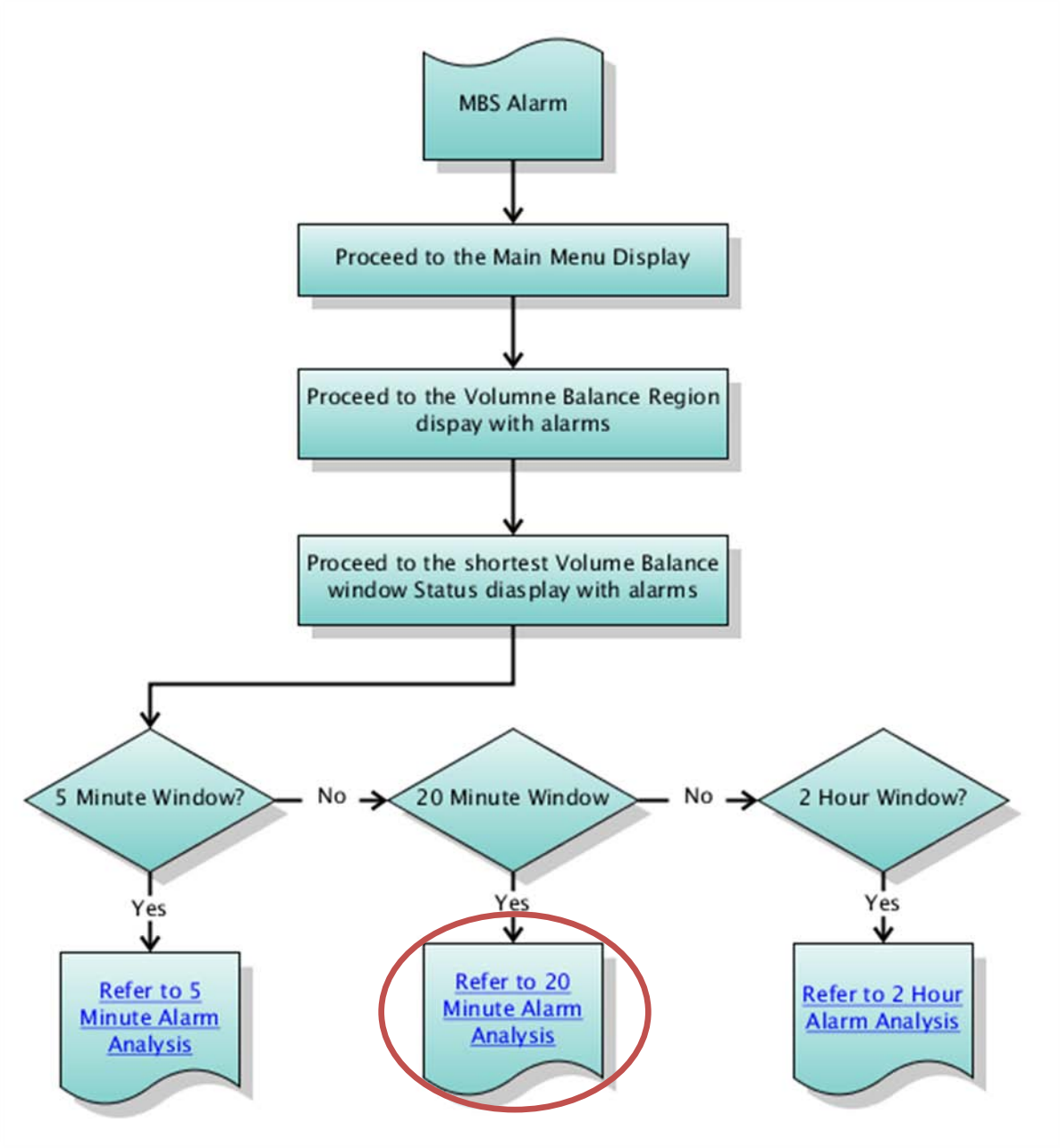

Determine start time, location and pattern of Diagnostic Flows
Proceed to all Flow (Q) Trends
Proceed to all Pressure (P) Trends
Column Separation?
Q data change coincident with DF?
P Data change coincident with DF?
Frozen Data?
Commout?
No
No
No
No
Yes
Yes
Yes
Yes
Yes
Refer to Column Separation Analysis
Refer to Q Data Analysis
Refer to P Data Analysis
Refer to Frozen Data Analysis
Refer to Frozen Data Analysis
Contact Backup
No

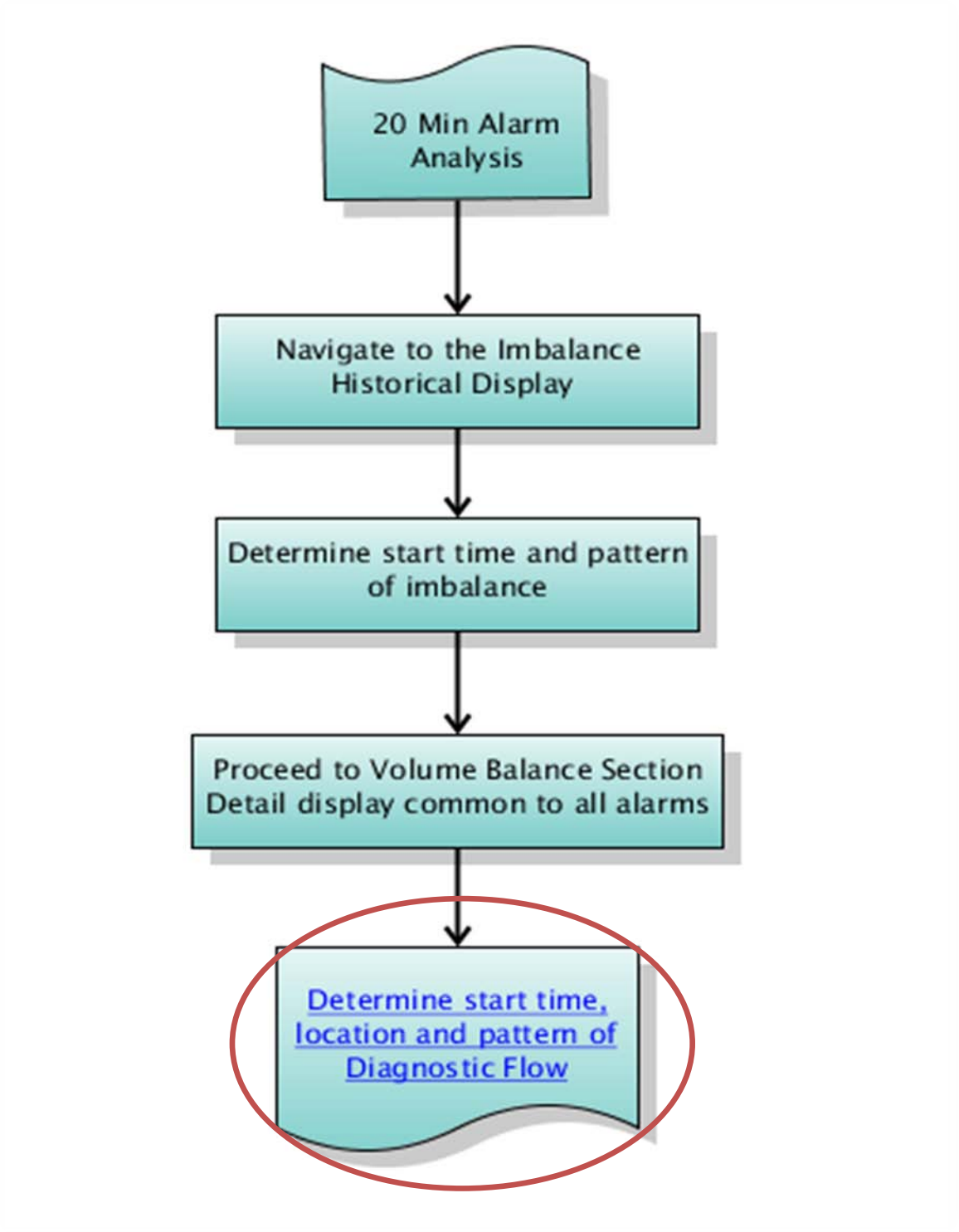
Final Step

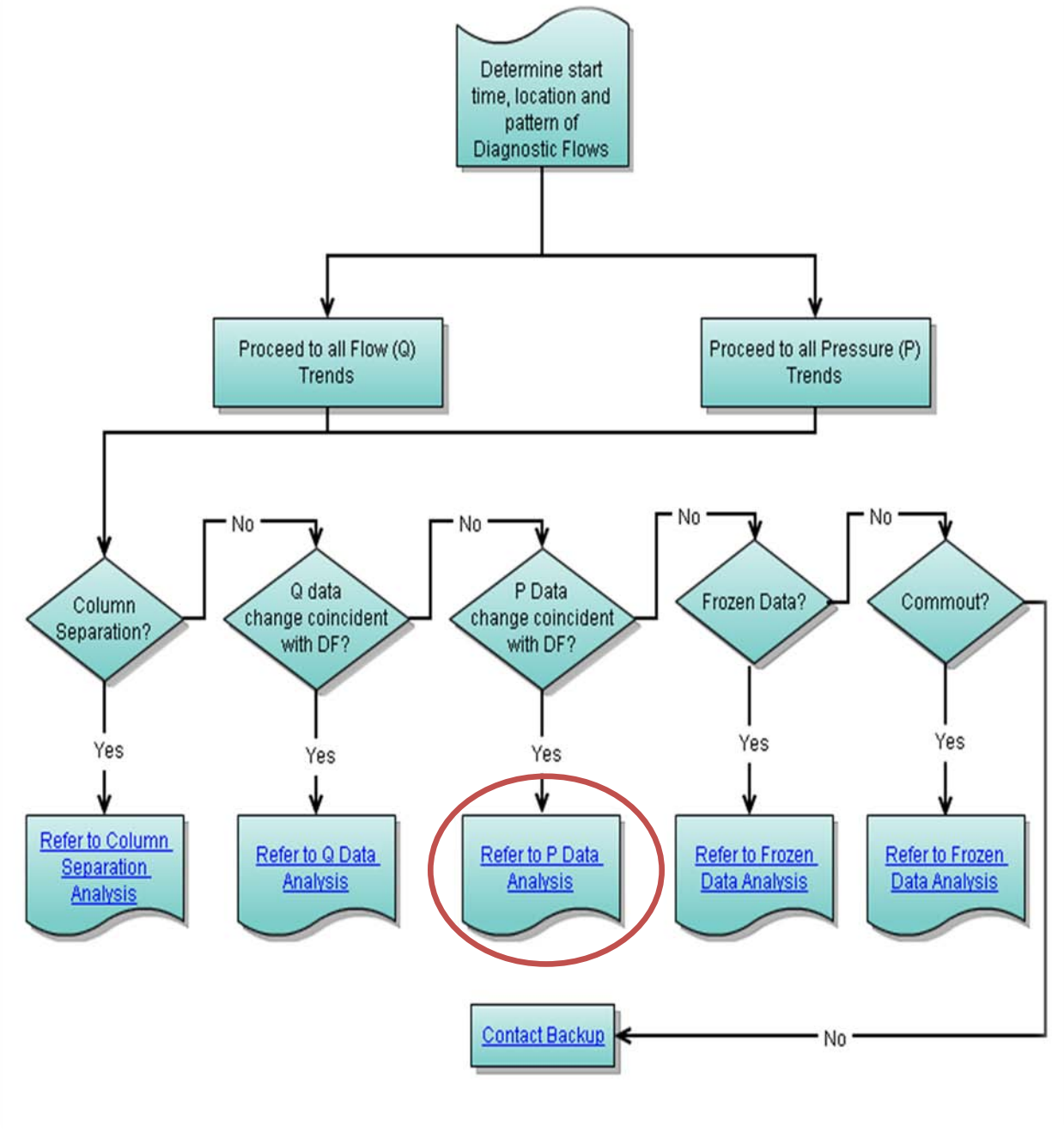

Column Separation Analysis
Navigate to the density display for the problematic region of pipeline
Liquid Fraction at problematic region?
Yes
No
Contact the CCO Shift Lead
Indicate that the model is indicating a column separation on the line
Indicate that the model is not reliable when there is two-phase fluids
Indicate that it is the decision of CCO as to whether they want to start up, but offer to monitor the model to see if the model acts as anticipated after the column is integrated
MBS Analyst will inform CCO Shift Lead when column is integrated and advise on progress of column integration
Contact the CCO Shift Lead
Determine start time, location and pattern of diagnostic flows

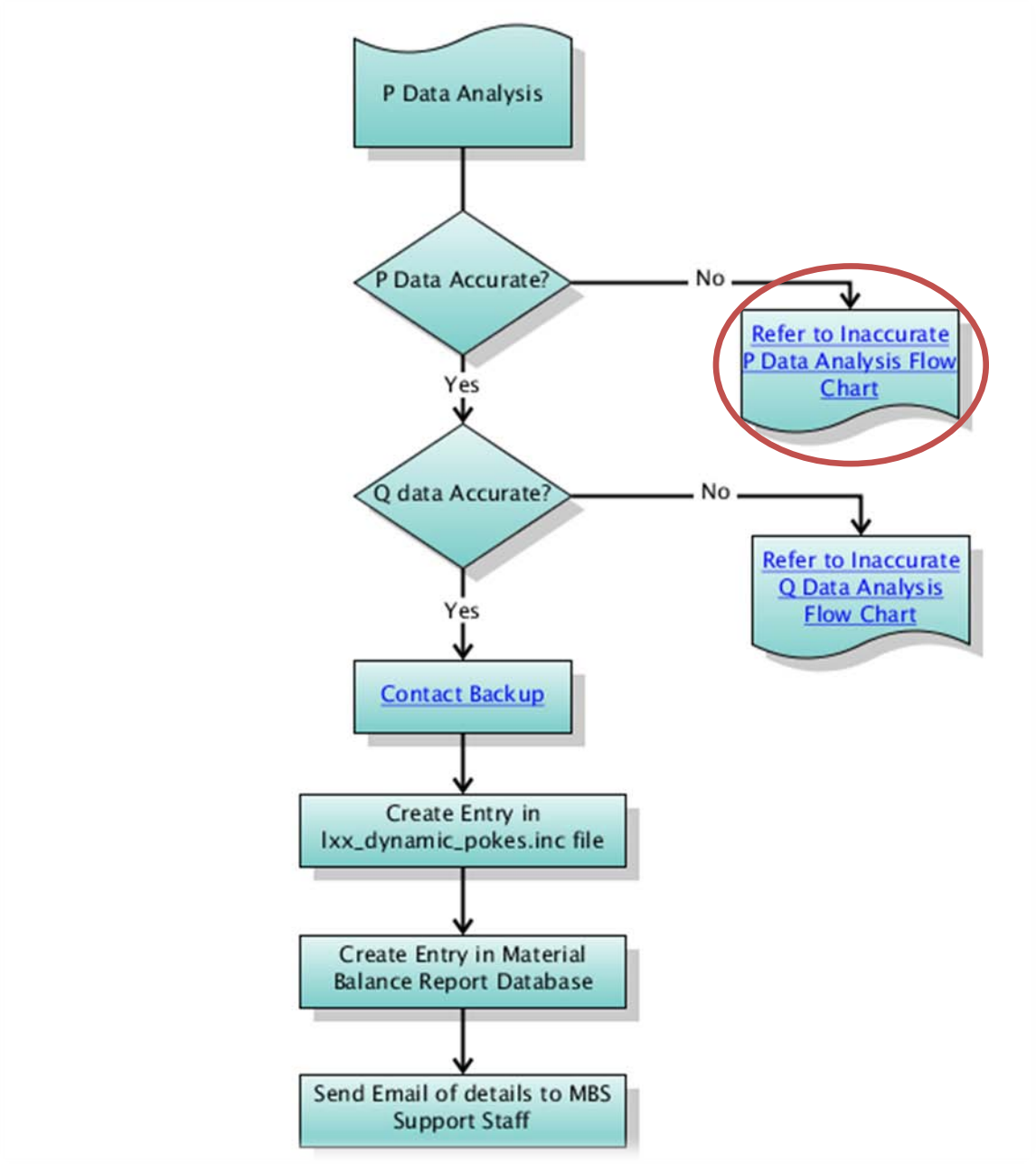
2) Using the flow chart to respond to a 20-min MBS alarm related to a frozen pressure transmitter.

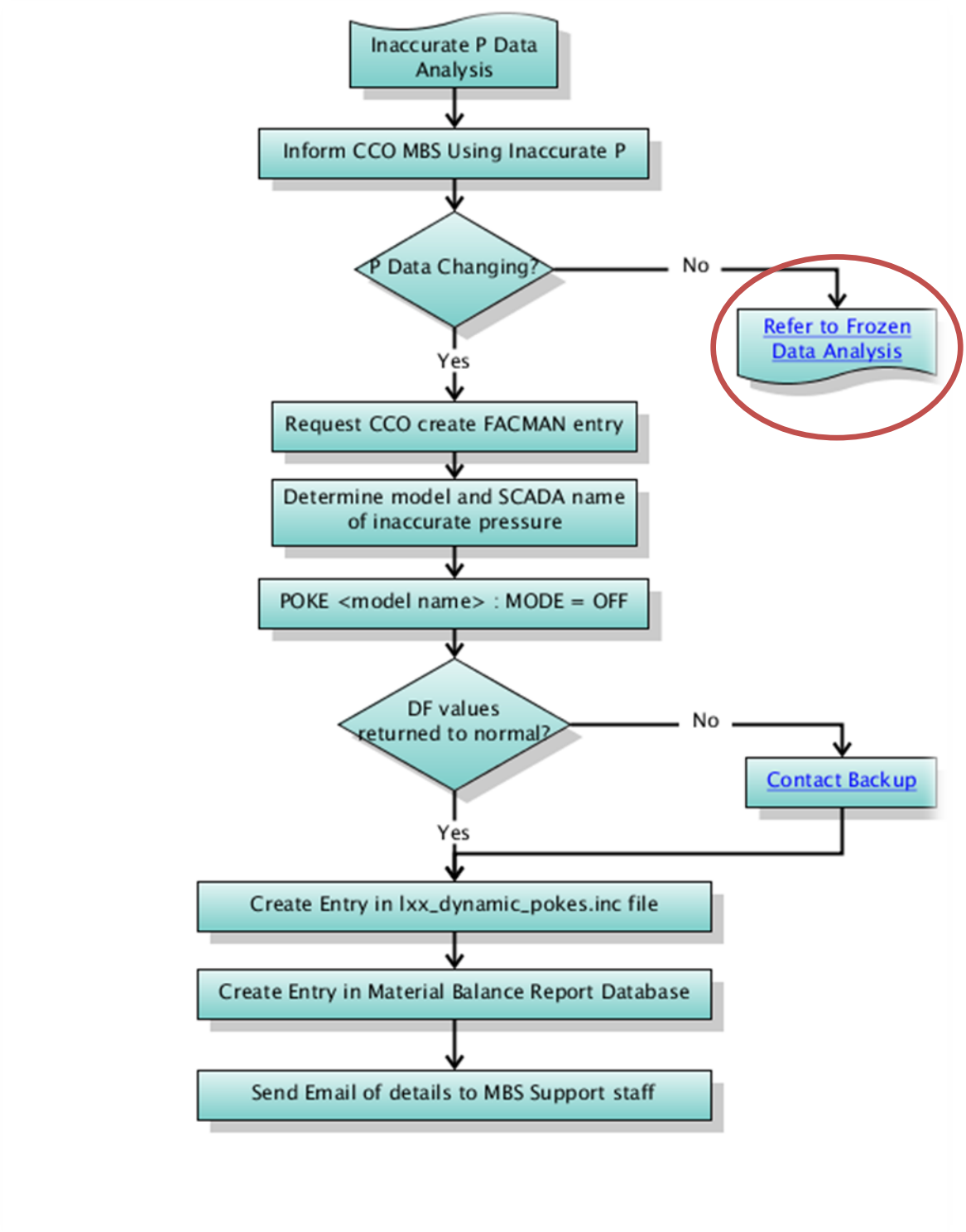



MBS Alarm
Proceed to the Main Menu Display
Proceed to the Volumne Balance Region dispay with alarms
Proceed to the shortest Volume Balance window Status diasplay with alarms
5 Minute Window?
No
20 Minute Window
No
2 Hour Window?
Yes
Yes
Yes
Refer to 5 Minute Alarm Analysis
Refer to 20 Minute Alarm Analysis
Refer to 2 Hour Alarm Analysis

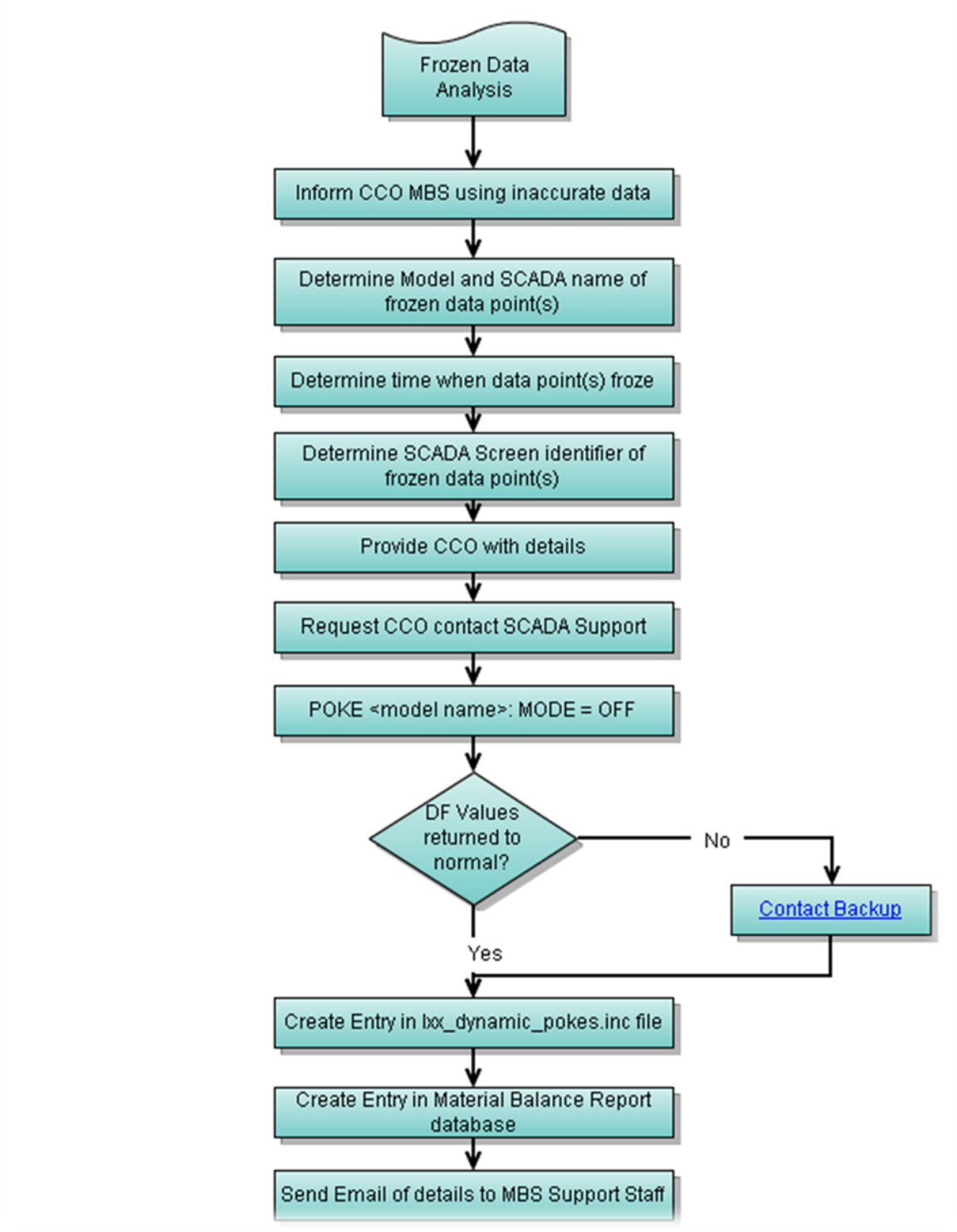

20 Min Alarm Analysis
Navigate to the Imbalance Historical Display
Determine start time and pattern of imbalance
Proceed to Volume Balance Section Detail display common to all alarms
Determine start time, location and pattern of Diagnostic Flow


Determine start time, location and pattern of Diagnostic Flows
Proceed to all Flow (Q) Trends
Proceed to all Pressure (P) Trends
Column Separation?
No
Q data change coincident with DF?
No
P Data change coincident with DF?
No
Frozen Data?
No
Commout?
Yes
Yes
Yes
Yes
Yes
Refer to Column Separation Analysis
Refer to Q Data Analysis
Refer to P Data Analysis
Refer to Frozen Data Analysis
Refer to Frozen Data Analysis
Contact Backup
No

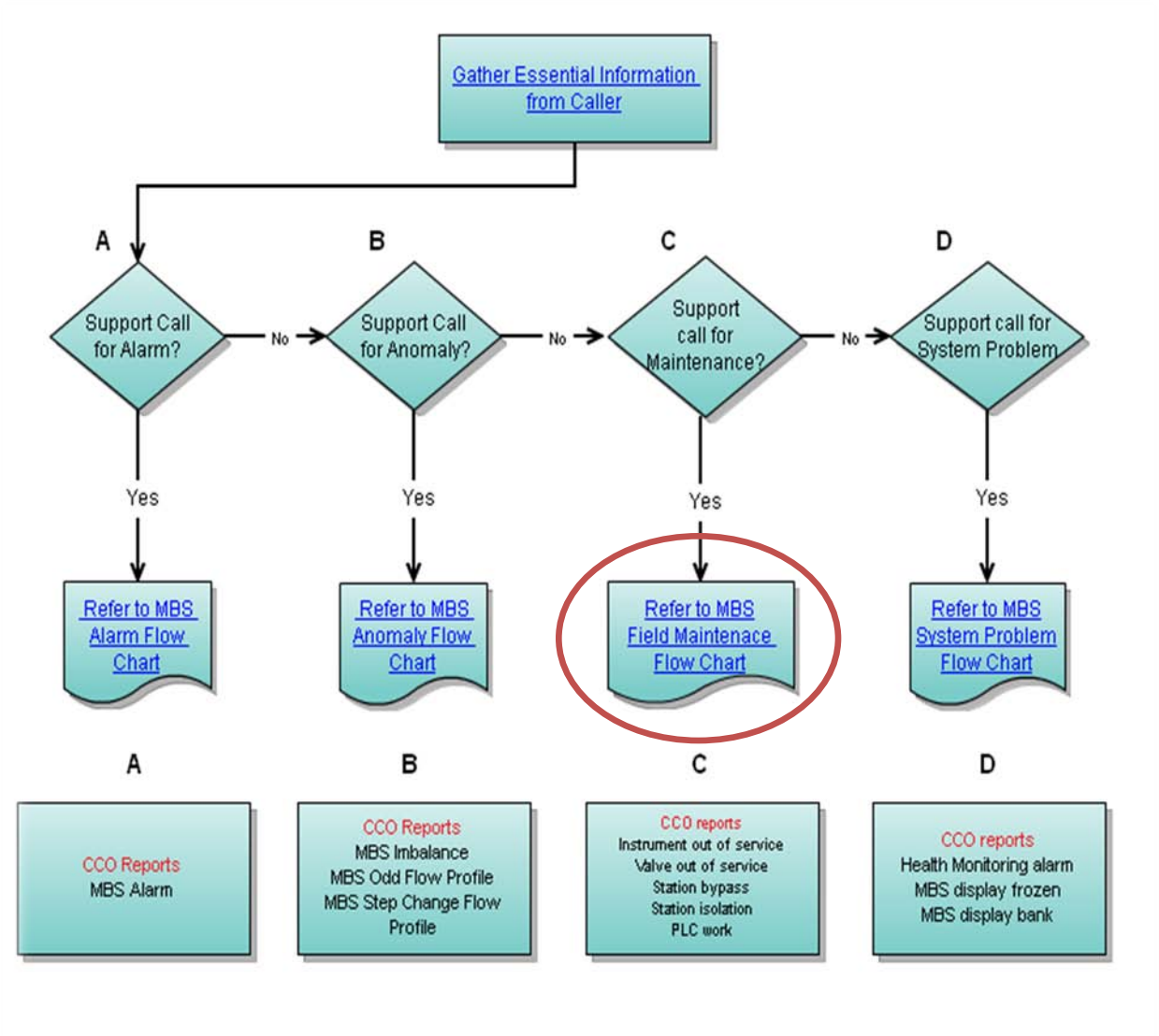

P Data Analysis
P Data Accurate?
No
Refer to Inaccurate P Data Analysis Flow Chart
Yes
Q data Accurate?
No
Refer to Inaccurate Q Data Analysis Flow Chart
Yes
Contact Backup
Create Entry in Ixx_dynamic_pokes.inc file
Create Entry in Material Balance Report Database
Send Email of details to MBS Support Staff

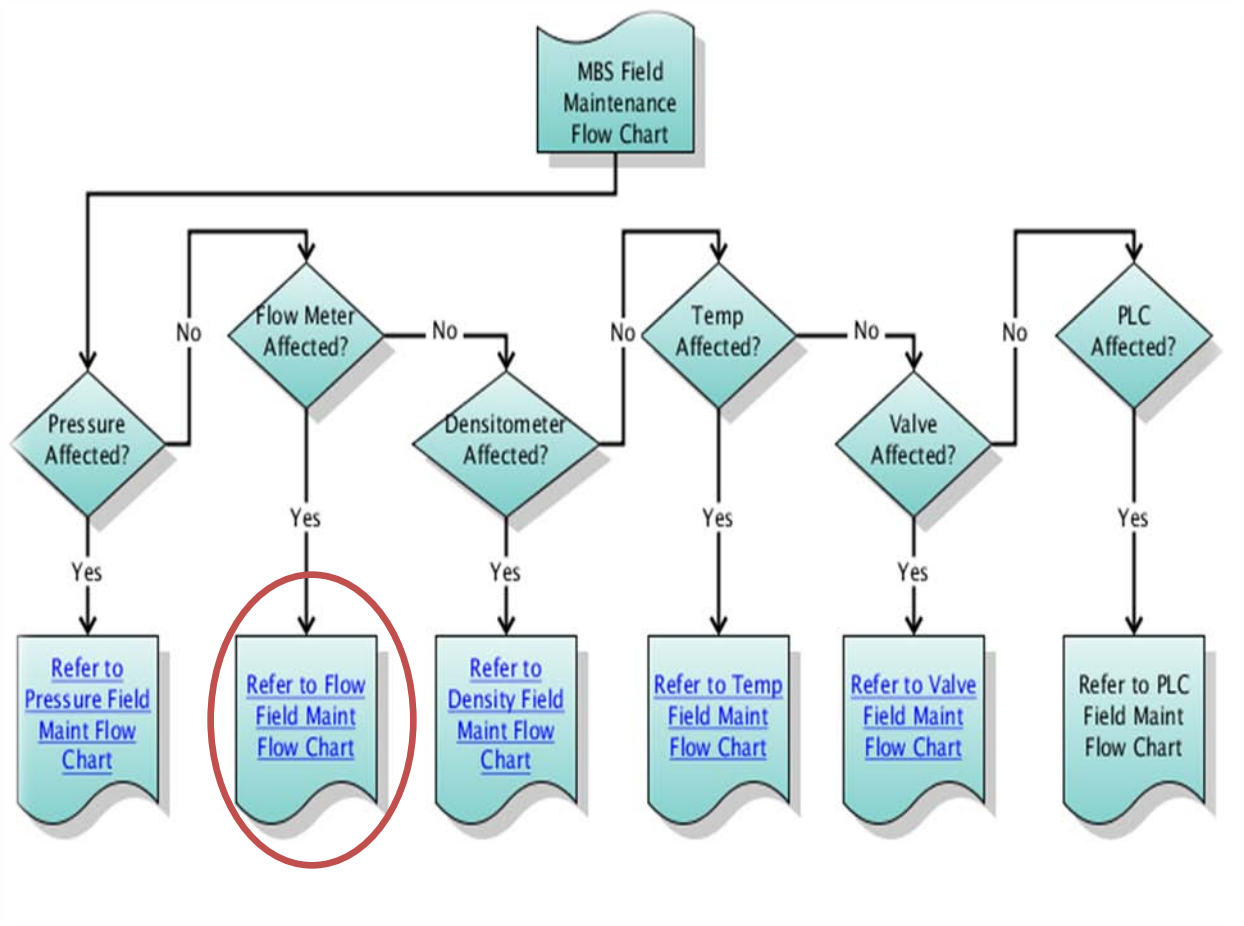

Inaccurate P Data Analysis
Inform CCO MBS Using Inaccurate P
P Data Changing?
No
Refer to Frozen Data Analysis
Yes
Request CCO create FACMAN entry
Determine model and SCADA name of inaccurate pressure
POKE <model name> : MODE = OFF
DF values returned to normal?
No
Contact Backup
Yes
Create Entry in lxx_dynamic_pokes.inc file
Create Entry in Material Balance Report Database
Send Email of details to MBS Support staff

Final Step

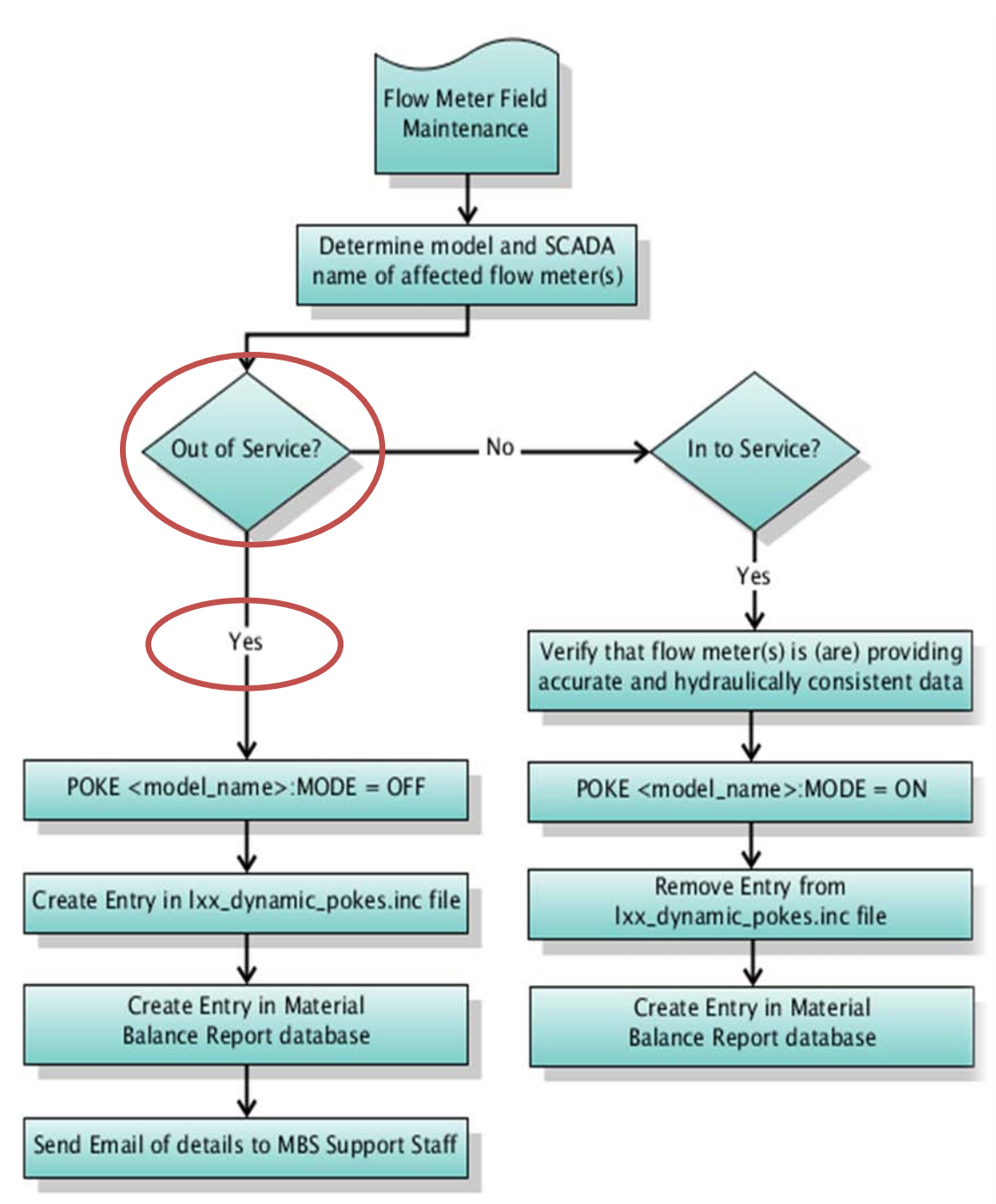

Frozen Data Analysis
Inform CCO MBS using inaccurate data
Determine Model and SCADA name of frozen data point(s)
Determine time when data point(s) froze
Determine SCADA Screen identifier of frozen data point(s)
Provide CCO with details
Request CCO contact SCADA Support
POKE <model name>: MODE = OFF
DF Values returned to normal?
No
Contact Backup
Yes
Create Entry in lxx_dynamic_pokes.inc file
Create Entry in Material Balance Report database
Send Email of details to MBS Support Staff

3) Using the flow chart to respond to a field maintenance notification (Flow meter to be taken out of service for repairs).




MBS Field Maintenance Flow Chart
Pressure Affected?
No
Flow Meter Affected?
No
Densitometer Affected?
No
Temp Affected?
No
Valve Affected?
No
PLC Affected?
Yes
Yes
Yes
Yes
Yes
Yes
Refer to Pressure Field Maint Flow Chart
Refer to Flow Field Maint Flow Chart
Refer to Density Field Maint Flow Chart
Refer to Temp Field Maint Flow Chart
Refer to Valve Field Maint Flow Chart
Refer to PLC Field Maint Flow Chart

Final Step


Flow Meter Field Maintenance
Determine model and SCADA name of affected flow meter(s)
Out of Service?
No
In to Service?
Yes
Yes
Verify that flow meter(s) is (are) providing accurate and hydraulically consistent data
POKE <model_name>:MODE = OFF
POKE <model_name>:MODE = ON
Create Entry in lxx_dynamic_pokes.inc file
Remove Entry from lxx_dynamic_pokes.inc file
Create Entry in Material Balance Report database
Create Entry in Material Balance Report database
Send Email of details to MBS Support Staff