X-Force Alarm Client Reports

X-Force Alarm Client is basically used for the analysis of alarms or events captured from the control system. X-Force Alarm Client includes Four different type of Categories for analyses, all developed to provide judgment for key alarm performance factors. Each analysis available fits into one of these categories.

- General Reports
- Alarm System Performance
- Alarm System Settings
- Process changes

General Reports: The analyses in this category focus on the detailed analysis of alarm Events occurrence. This analyses provide in depth detail for the different parameters of the alarm events. Some analyses may not be available for some DCS systems. The alarm system performance category includes the following types of analyses:

Analysis Type	Description
History Alarm	The **History Alarm** analysis Present the History of Alarm events for the specified time period.
Age of oldest Alarm	The **Age of oldest Alarm** analysis displays a list of alarms that sounded within a specified time span but have not returned to normal for more than Specified Duration (8 Hours).
Operator Action	The **Operator Action** analysis present the list of operator Alarms for the specified time period.
System Alarm	The **System Alarm** analysis present the list of System Alarms for the specified time period.
Key Performance Indicator	The **Key Performance Indicator** (**KPI**) summarizes Alarm Activities and display Comparative analysis against the predefined KPI Standards.it present Plant stability in comparison with KPI Standards by displaying different analysis in one Report.
Frequency Analysis	The **Frequency analysis** reveals important trends in alarm activity by displaying the number of times an alarm event occurred during the given time.it present Alarm Activity as per different Parameters of Alarm Events Behavior. It also display alarm occurrence differently with grouping of particular selected parameter in report.
Treemap Analysis	The **Treemap Analysis** present the alarm event's frequency details by displaying the number of times alarm event occurred .This report is the graphical representation of alarm frequency
Frequency Breakup	The **Frequency Breakup** summarizes alarm activities and display alarm occurrence differently with grouping of particular selected alarm detail.
Frequency Monitoring	The **Frequency Monitoring** Reveals important detail about alarm activity by displaying Isolated details about each alarm and its occurrence. This report monitors the alarm activity for the specified range of alarm events frequency.
Duration Analysis	The **Duration Analysis** Recognize the Alarm event's Return and Acknowledge State exploration for the Specified time Duration.

Alarm Burst	The **Alarm Burst** analysis present the Rush of Alarm events for the specified time Period.
Alarm Performance Overview	The **Alarm Performance overview** present the day/hour wise alarm Activity analysis .it will display daily/hourly alarm Rate, Average alarm rate ,total alarm Occurrence ,etc.
Alarm Rate	The **Alarm Rate** analysis Present day wise Rate of Alarm Events for the Specified Month Duration.
Symptomatic Alarms	The **Symptomatic Alarms** Revels the symptoms of alarm activity relevant to the Tagname with all alarm details .it display tags and its concurrent activity before and after any particular Tagname.
Trip Analysis	The **Trip analysis** Graphically represent the Data of one hour in slots of minutes with total alarm occurrences.

Alarm System Performance: The analyses in this category focus on information specific to the performance of the alarm management system. Alarm System Performance analyses are only available for data owners that have imported alarm event data into the system. Some analyses may not be available for some DCS systems. The alarm system performance category includes the following types of analyses:

Analysis Type	Description
Alarm By Type	The **Alarm by Type** analysis summarizes alarm activities per alarm parameter for the specified time period.
Alarm By Unit	The **Alarms by Unit** analysis reveals important details about alarm events for each unit during the given time period.
Alarm Flood	The **Alarm Flood** analysis summarizes alarm activities during flood periods.
Alarm Per Time Period	The **Alarms per Time Period** analysis summarizes alarm activities based on define Duration interval.
Alarm Summary	The **Alarm Summary** analysis presents a comprehensive summary of alarm performance by running several different analyses over defined time periods.
Chattering Alarm	The **Chattering Alarm** analysis identifies entities that generate a burst of alarm activity that cycles in and out of alarm very rapidly.
Consequential Alarm	A consequential alarm becomes active as a result of another alarm. The **Consequential Alarm** analysis indicates entities that have gone into an alarm state and other entity/alarm combinations that became active before and after the alarm event
Duplicate Alarm	The **Duplicate Alarms** analysis identifies potentially redundant alarms, based on the alarm's context, via the Tagname, Comment.
Frequent Alarm	The **Frequent Alarms** analysis reveals important trends in alarm activity by displaying the number of times an alarm event occurred during the given time.
Priority Distribution	The **Priority Distribution** analysis identifies the number of alarms by priority.
Stale Alarm	The **Stale Alarms** analysis displays entities that have been in an alarm state for an extended period of time (e.g., longer than a shift) without returning to the normal state.

Standing Alarm	The **Standing Alarms** analysis displays a list of alarms that sounded within a specified time span but have not returned to normal.
Time in Alarm	The **Time in Alarm** analysis documents the length of time an entity spends in an alarm state before returning to its normal state.
Time to Acknowledge	The **Time to Acknowledge** analysis indicates the average operator response time to alarm events.

Alarm System Settings: The analyses in this category provide a record of the current alarm configuration, including which tags have alarms set, the priorities of alarms, which alarms are currently disabled or inhibited, etc. Alarm System Settings analyses are only available after static point configuration data has been imported into X-Force AIMS. In addition, not all analyses are available for all DCS systems. Analyses of alarm system settings consist of the following:

Analysis Type	Description
Alarms set by Priority	The **Alarms Set by Priority** analysis is a breakdown of the number of configured alarms grouped by alarm priorities as defined by the control system manufacturer.
Alarms set by Type	This **Alarms Set by Type** analysis is a breakdown of the number of configured alarms grouped by the specific alarm types as defined by the control system manufacturer.
Alarms set by Tag Type	The **Alarms set by Type** analysis is a breakdown of the configured tags grouped By specific tag types as defined by the control system manufacturer.
Tags with Alarms	The **Tags with Alarms** analysis is a breakdown of the number of tags with configured alarms versus the number of tags that could have configured alarms within the control system.

Process Changes: The analyses in this category focus on operator-initiated events, including controller mode, set point, and alarm state changes. Analyses of Process Changes are only available after operator change event data have been imported into the system. Some analyses may not be available for some DCS systems. Process Change analyses consist of the following:

Analysis Type	Description
Alarm Priority Changes	The **Alarm Priority Changes** analysis summarizes changes made to the process value placed on alarm events.
Alarm Trip Points	The **Alarm Trip Points** analysis displays changes made to the value of analog trip point settings
Changes per Time Period	The **Changes per Time Period** analysis indicates the number of process changes during a predefined time period.
Controller Modes Changes	The **Controller Modes Changes** analysis indicates the amount of time that entities with journal mode changes spend in the journal mode(s).
Controller Set points Changes	The **Controller Set points Changes** analysis reveals changes to set points affecting desirable alarm trip-point settings for a specific entity.
Frequent Changes	The **Frequent Changes** analysis displays the all operator changes sorted by the most frequent.

Others Changes	The **Others Changes** analysis discovers all process changes that are not captured by any of the specific analyses described previously. This catch-all analysis enables the convenient evaluation of miscellaneous changes.
Outputs -Analog changes	The **Outputs -Analog changes analysis** results include a list of entities, and for each entity, the output minimum, maximum and span, number of output changes, and the entity point description. The analysis also displays the total number of output changes and the total number of unique entities with output changes.
Outputs - Digital changes	The **Outputs - Digital changes** analysis results include a list of entities, and for each entity, the number of output changes, and the entity point description. The analysis also displays the total number of output changes and the total.
Ranges	The **Ranges** analysis detects changes made in ranges associated with the Process Value.
Tunning Constants	The **Tuning Constants** analysis summarizes changes to the standard PID tuning constants for gain, integral action, and derivative action.

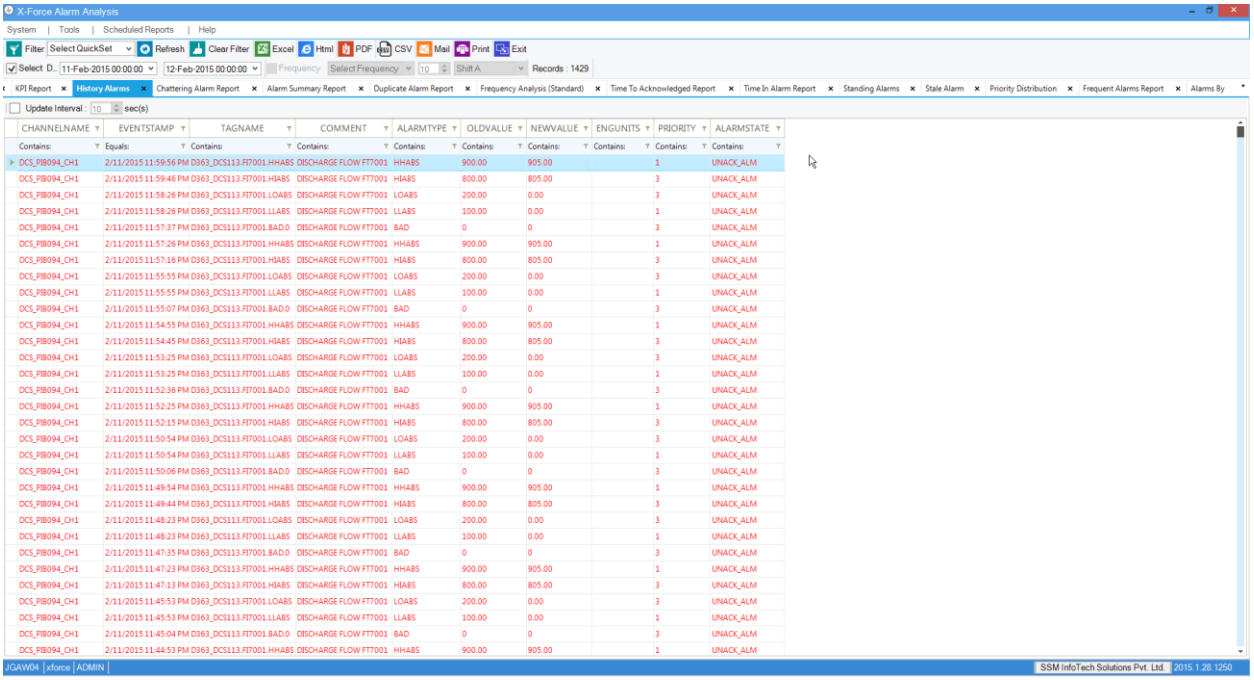
General Reports

History Alarm

The **History Alarm** analysis Present the History of Alarm events for the specified time period.

Auto Updates of Alarm History is also available. If Auto update interval is selected than History Report will be updated automatically after the Specified time. Before the time analysis is done, all alarms should be display as History alarm.

Navigation: Report Menu -> General Reports -> History Alarm



To analyze History of Alarm: Follow Steps as mention below to do Analysis with History Alarm.

1) Go to Reports Menu and select General Reports, in that select History Alarm and click on it.
2) Select Start Date and End Date Parameters from Criteria Toolbar
3) Set Interval time if you want to put History alarm Report to be updated automatically.
4) Click on Refresh button from Operation Toolbar

Count Verification Method:

- Use below query to find History alarm count

```
Select count (*) from vw_data_alarm_field where msgtype='alm' and eventstamp between '21-Sep-2016 04:00:00' and '22-Sep-2016 04:00:00'
```

- In above query event stamp should be the Duration of Date for which you are doing analysis in report. This query will return History Alarm count for Given Dates.
- Above query will return Total Alarm Count

Age of oldest Alarm

The Age of oldest Alarm analysis displays a list of alarms that sounded within a specified time span but have not returned to normal for more than Specified Duration (8 Hours).this report is same as standing alarm Report.

An Alarm in an Active Alarm state and is present continuously More than 8 Hours than is Call Age of Oldest Alarm. Before 8 Hours alarms are display in standing Alarm.

Age of Oldest Alarm = No of alarms which was not resetted for more than 8 Hours.

Navigation: Report Menu -> General Reports -> Age of Oldest Alarm

To analyze Age of Oldest Alarm: Follow Steps as mention below to do Analysis with Age of Oldest Alarm.

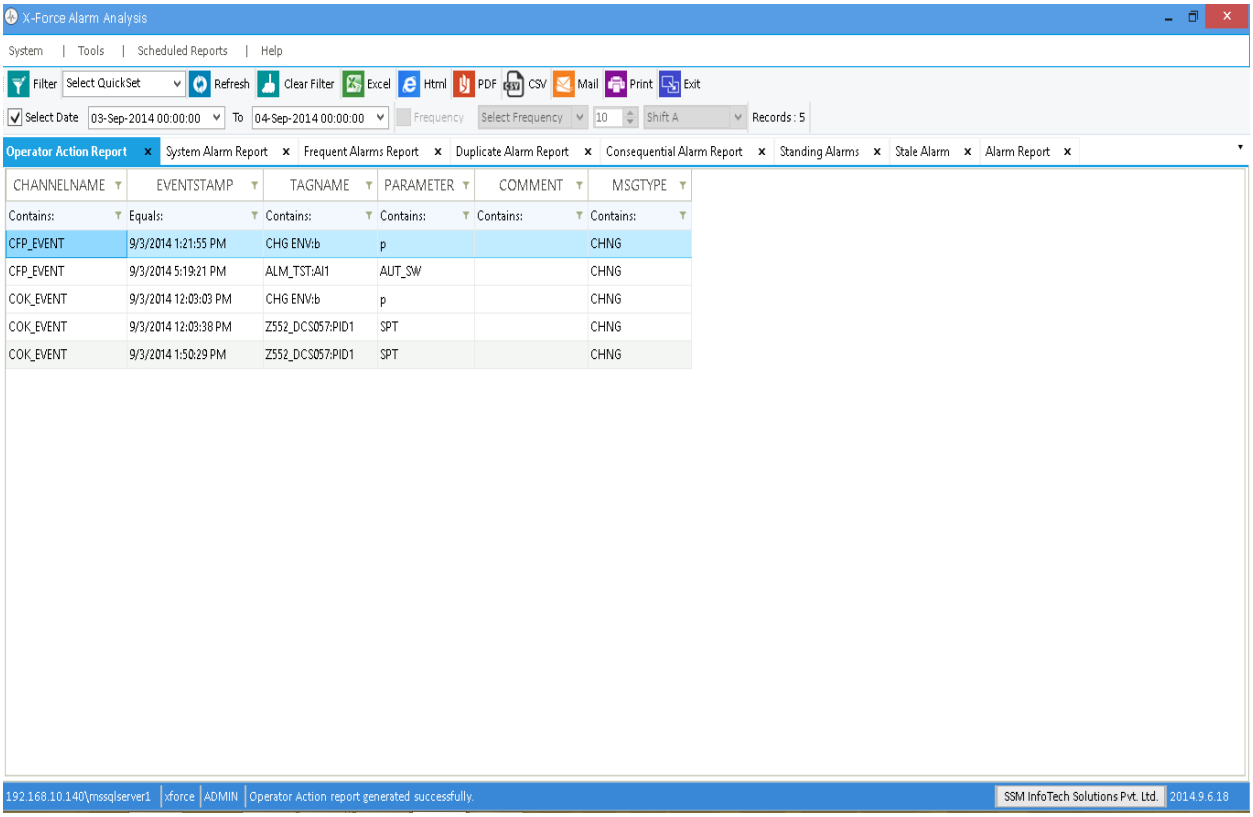
1) Go to Reports Menu and select General Reports, in that select Age of Oldest Alarm and click on it.
2) Select Start Date and End Date Parameters from Criteria Toolbar
3) Set Duration (in Hours) to check standing Alarm Before specified Duration .by default it will consider 8 Hours as per Standard Definition.
4) Click on Refresh button from Operation Toolbar

Note: For Reliance This Report Will Be Consider as Standing alarm Report.

Operator Action

The **Operator Action** analysis present the list of operator Alarms for the specified time period.

Navigation: Report Menu -> General Reports -> Operator Action



To analyze Operator Action Report: Follow Steps as mention below to do Analysis with Operation Action.

1) Go to Reports Menu and select General Reports, in that select Operator Action and click on it.

2) Select Start Date and End Date Parameters from Criteria Toolbar
3) Click on Refresh button from Operation Toolbar

Count Verification Method:

- **Use below query to find Operator Alarms**

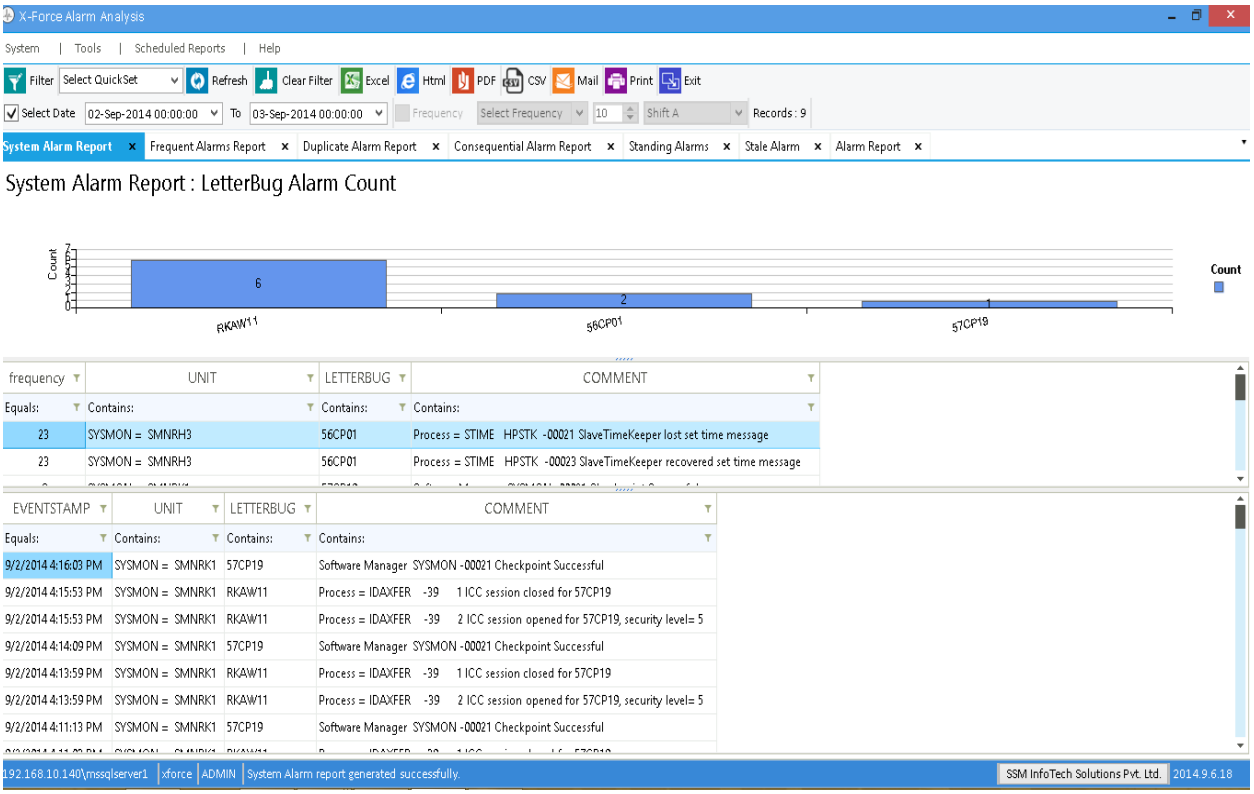
```
Select * from vw_data_alarm_field where msgtype='OPR' or Msgtype = 'CHNG' and eventstamp between '21-Sep-2016 04:00:00' and '22-Sep-2016 04:00:00'
```

- In above query event stamp should be the Duration of Date for which you are doing analysis in report. This query will return Operator Alarm Detail for the Given Dates.
- Above query will return all Operator Alarms

System Alarm

The **System Alarm** analysis present the list of System Alarms for the specified time period. Alarms Generated due to Faults in Software or Hardware are called System alarms.

Navigation: Report Menu -> General Reports -> System Alarm



To analyze System Alarm: Follow Steps as mention below to do Analysis with System Alarm.

4) Go to Reports Menu and select General Reports, in that select system Alarm and click on it.
5) Select Start Date and End Date Parameters from Criteria Toolbar
6) Click on Refresh button from Operation Toolbar

Count Verification Method:

- **Use below query to find Operator Alarms**

```
Select * from vw_data_alarm_field where msgtype='Sys' and eventstamp between '21-Sep-2016 04:00:00' and '22-Sep-2016 04:00:00'
```

- In above query event stamp should be the Duration of Date for which you are doing analysis in report. This query will return system Alarm Detail for the Given Dates.

Key Performance Indicator

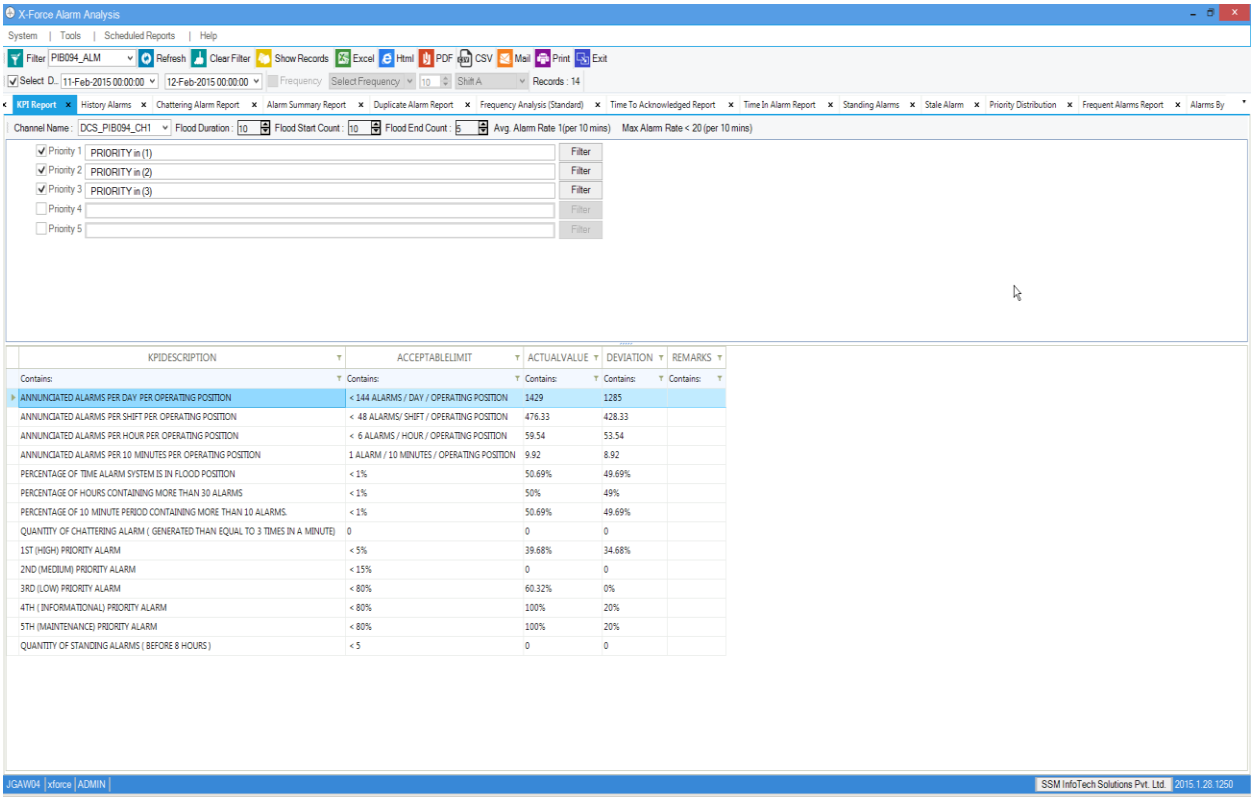
The **Key Performance Indicator** (**KPI**) summarizes Alarm Activities and display Comparative analysis against the predefined KPI Standards.it present Plant stability in comparison with KPI Standards by displaying different analysis in one Report.

KPI Report will Analyze the Data as per the below Formula for the each criteria in KPI Report

Sr. No	Description	Formulation
1	Annunciated alarms per day per operating position	Total Alarms for a day / (3/Operating Position)
2	Annunciated alarms per shift per operating position	Total Alarms for a day /(Shift Count * (3/Operating Position))
3	Annunciated alarms per hour per operating position	Total Alarms for a day /(24 * (3/Operating Position))
4	Annunciated alarms per 10 minutes per operating position	Total Alarms for a day /(144 * (3/Operating Position))i.e. 144=(24*60)/10
5	Percentage of time alarm system is in flood position	((Summation of minutes in which there is flood condition) /(24*60)) *100
6	Percentage of Hours containing more than 30 alarms	((Summation of Hours in which >30 Alarms in an hour) /(24)) *100

7	Percentage of 10 minute period containing more than 10 alarms.	((Summation of Minutes in which >10 Alarms in 10 Minutes) /(24)) *100
8	Quantity of chattering alarm (generated than equal to 3 times in a minute)	Count of chattering alarm in a day i.e. 3 Alarms in a Minute
9	1st (High) Priority alarm	Percentage of High Priority alarms in a day
10	2nd (Medium) Priority alarm	Percentage of Medium Priority alarms in a day
11	3rd (Low) Priority alarm	Percentage of Low Priority alarms in a day
12	4th (Informational) Priority alarm	Percentage of Informational Priority alarms in a day
13	5th (Maintenance) Priority alarm	Percentage of Maintenance Priority alarms in a day
14	Quantity of Standing alarms (Before 8 hours)	Count of Standing alarms whose RTN alarm has not come in system before 8 Hours duration

Navigation: Report Menu -> General Reports -> Key Performance Indicator



To analyze Key Performance Indicator: Follow Steps as mention below to do Analysis with Key Performance Indicator Report.

1) Go to Reports Menu and select General Reports, in that select Key Performance Indicator and click on it.
2) Select Start Date and End Date Parameters from Criteria Toolbar
3) Type a value for the number of minutes that defines a flood period (Flood Duration which is by Default 10 mins) and a value for the number of alarms at which to begin the flood (Flood Start Count which is by default 10)
4) In the Flood End Count box , type a value for the number of alarms at which to end a flood (must be less than the Begin flood at value and by default it is 5)
5) Click on Refresh button from Operation Toolbar.

Frequency Analysis

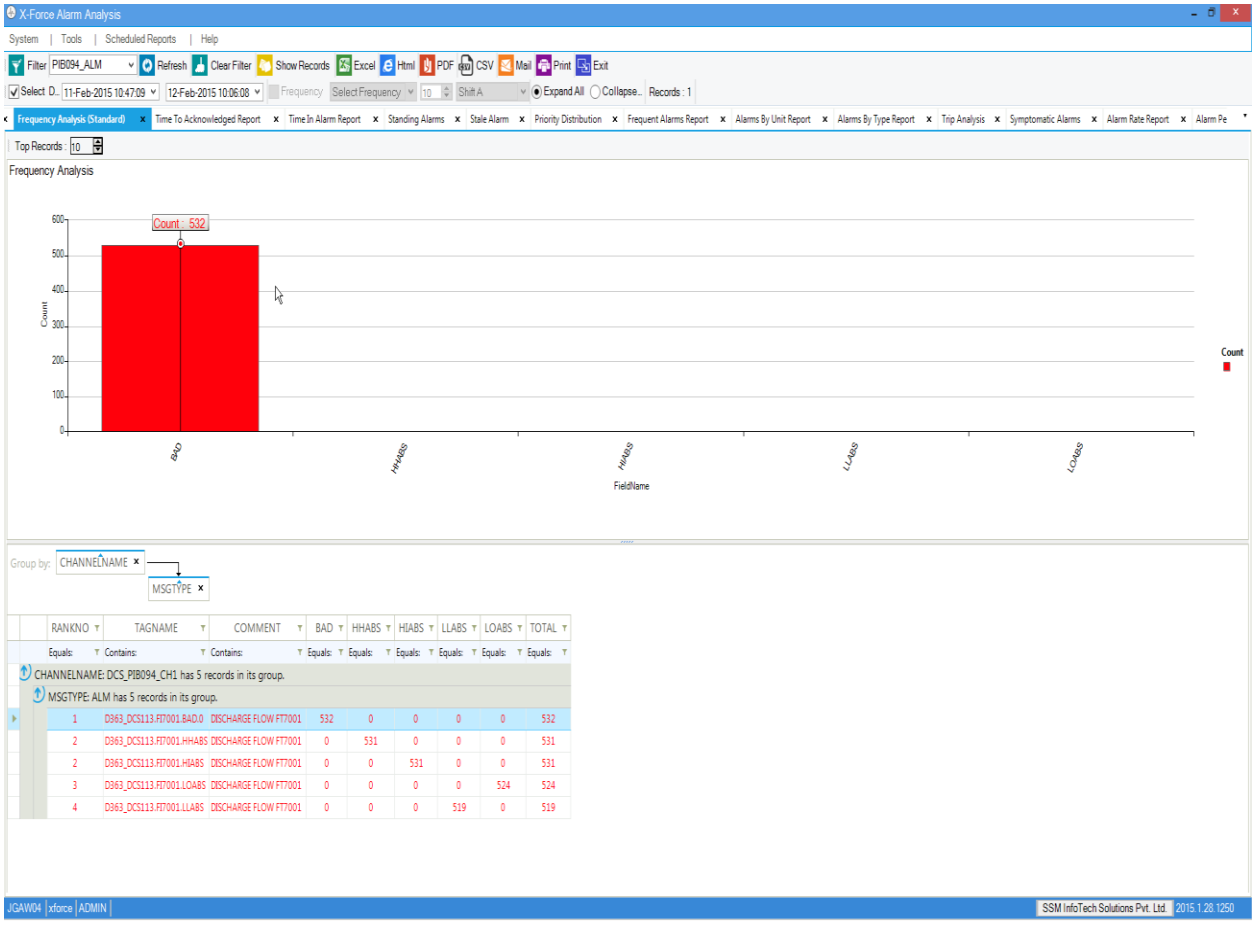
The **Frequency analysis** reveals important trends in alarm activity by displaying the number of times an alarm event occurred during the given time.it present Alarm Activity as per different Parameters of Alarm Events Behavior. It also display alarm occurrence differently with grouping of particular selected parameter in report.

Frequency analysis report Represents top highest frequency data for the given time duration .i.e. top records = 5 than it will display all tag details which has frequency 5 or less than 5.

Navigation: Report Menu -> General Reports -> Frequency Analysis

To analyze Frequency analysis: Follow Steps as mention below to do Analysis with Frequency analysis.

1) Go to Reports Menu and select General Reports, in that select Frequency analysis and click on it.
2) Select Start Date and End Date Parameters from Criteria Toolbar
3) Enter Any Numeric Value in Top Records box, to display top frequency Alarm Details.
4) Click on Refresh button from Operation Toolbar.



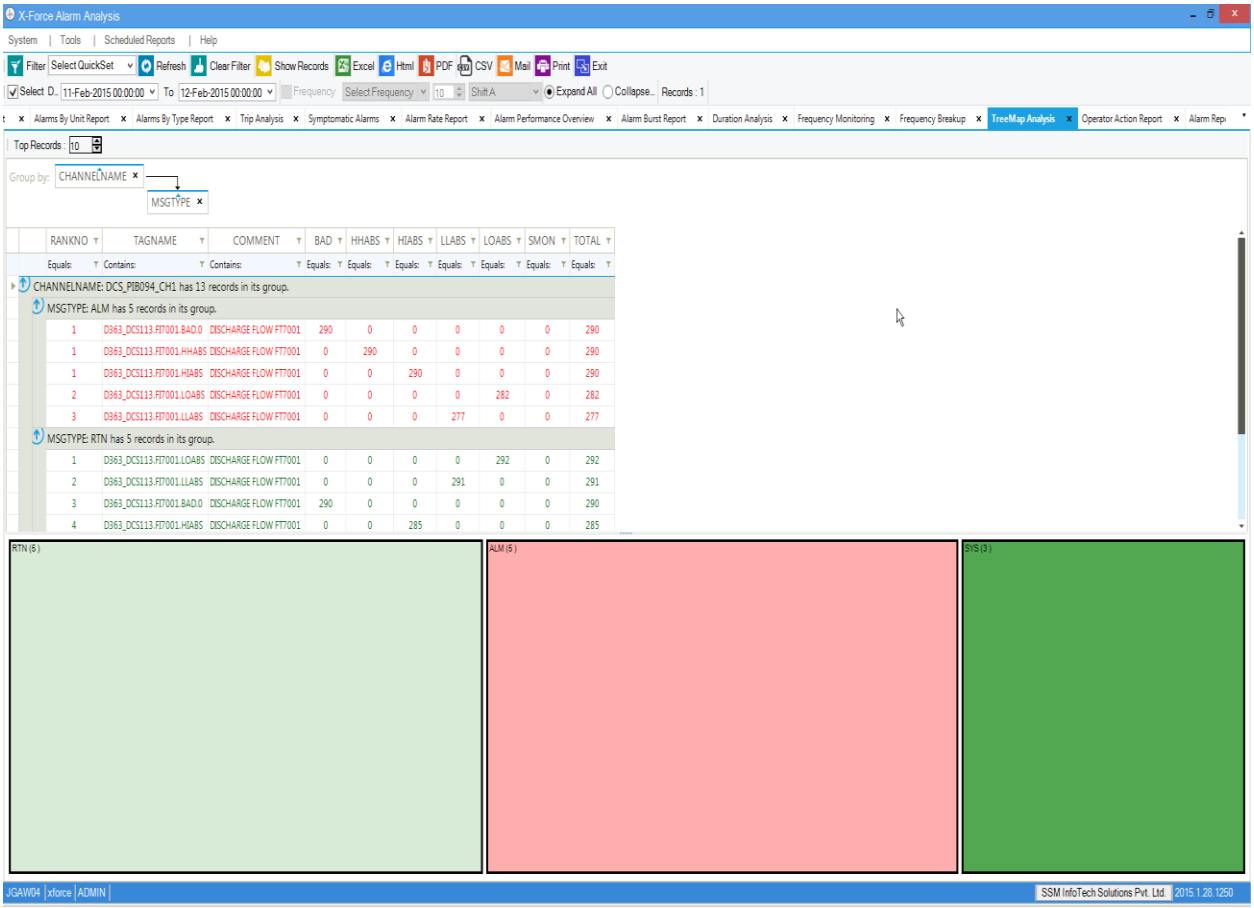
Treemap Analysis

The **Treemap Analysis** present the alarm event's frequency details by displaying the number of times alarm event occurred .This report is the graphical representation of alarm frequency.

Navigation: Report Menu -> General Reports -> Treemap Analysis

To analyze Treemap Analysis: Follow Steps as mention below to do Analysis with Treemap Analysis.

1) Go to Reports Menu and select General Reports, in that select Frequency analysis and click on it.
2) Select Start Date and End Date Parameters from Criteria Toolbar
3) Enter Any Numeric Value in Top Records box, to display top frequency Alarm Details.
4) Click on Refresh button from Operation Toolbar.



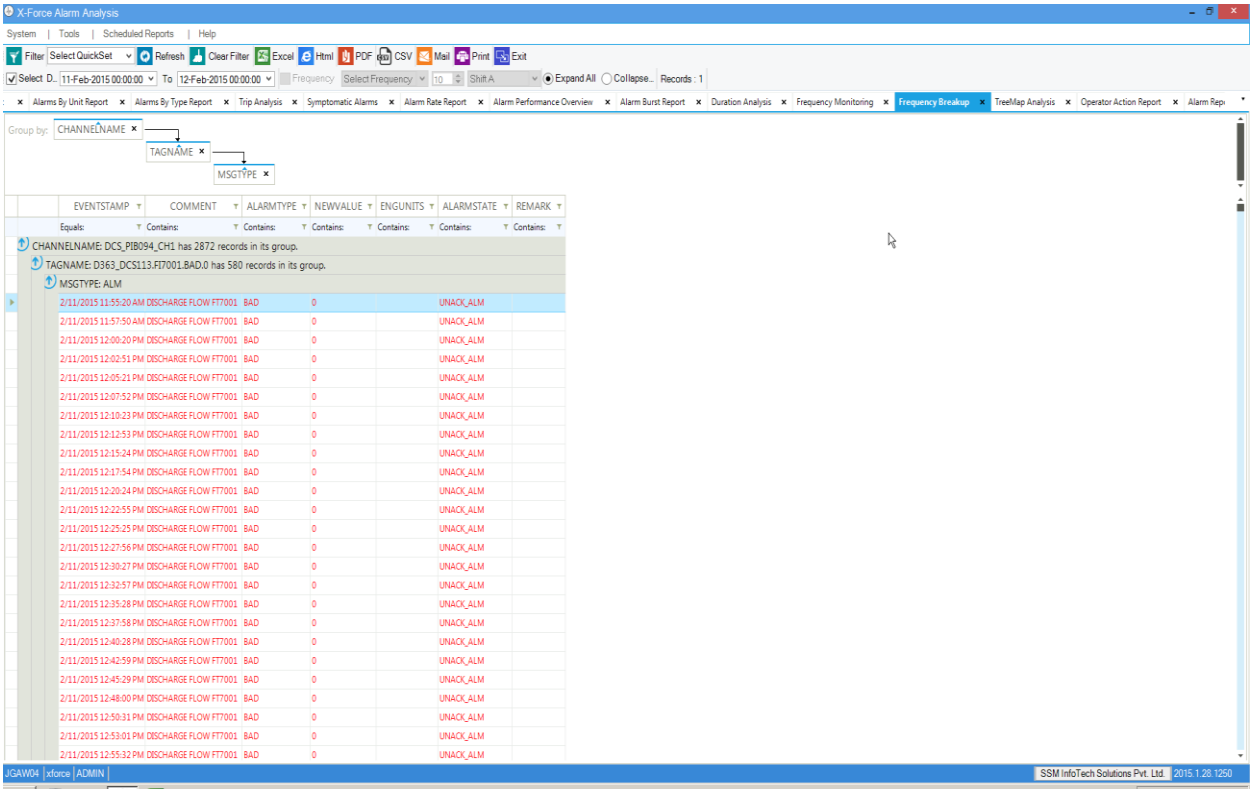
Frequency Breakup

The **Frequency Breakup** summarizes alarm activities and display alarm occurrence differently with grouping of particular selected alarm detail.

Navigation: Report Menu -> General Reports -> Frequency Breakup

To analyze Frequency Breakup: Follow Steps as mention below to do Analysis with Frequency Breakup

1) Go to Reports Menu and select General Reports, in that select Frequency Breakup and click on it.
2) Select Start Date and End Date Parameters from Criteria Toolbar
3) Click on Refresh button from Operation Toolbar.



Frequency Monitoring

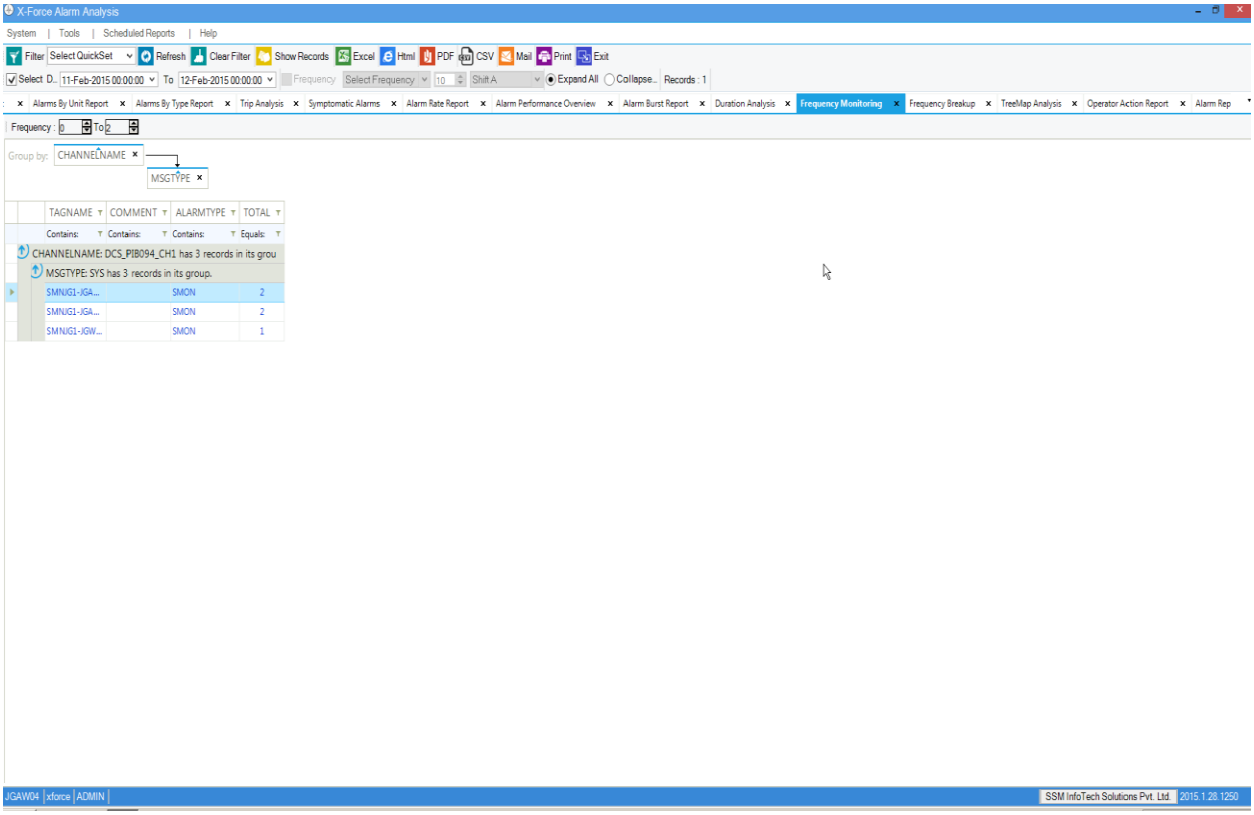
The **Frequency Monitoring** Reveals important detail about alarm activity by displaying Isolated details about each alarm and its occurrence. This report monitors the alarm activity for the specified range of alarm events frequency.

Frequency Monitoring reports allow to analyze the data between the specific Range of Alarm Frequency.

Navigation: Report Menu -> General Reports -> Frequency Monitoring

To analyze Frequency Monitoring: Follow Steps as mention below to do Analysis with Frequency Monitoring

1) Go to Reports Menu and select General Reports, in that select Frequency Monitoring and click on it.
2) Select Start Date and End Date Parameters from Criteria Toolbar
3) Select Range of Frequency to generate report which contains the frequency of alarms with in the specified range.
4) Click on Refresh button from Operation Toolbar.



Duration Analysis

The **Duration Analysis** Recognize the Alarm event's Return and Acknowledge State exploration for the Specified time Duration.

Top 10 alarms as per maximum time stay active for the defined period

Duration analysis Report Analyze duration between any Alarm and Return events.it is used to check alarm to return duration as well as alarm to Acknowledge Duration.it will also display minimum and maximum Return and Acknowledge Duration.

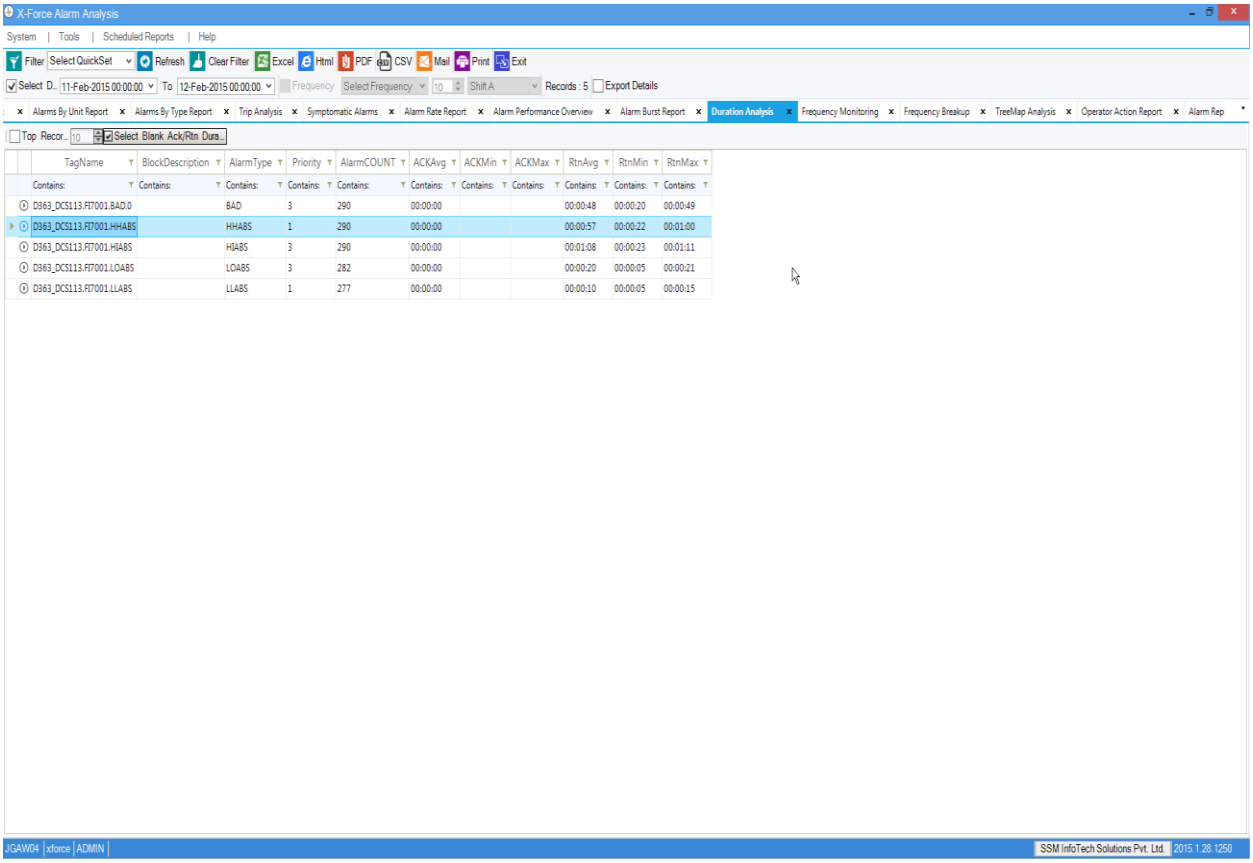
This makes it possible to analyze Average, Maximum, Minimum time taken to acknowledge or Return of alarm to Normal. This makes possible to find out which alarms are defined wrongly. Detection of chattering alarms or long retaining Alarms is easy.

Navigation: Report Menu -> General Reports -> Duration Analysis

To analyze Duration Analysis: Follow Steps as mention below to do Analysis with Duration Analysis

1) Go to Reports Menu and select General Reports, in that select Duration Analysis and click on it.
2) Select Start Date and End Date Parameters from Criteria Toolbar

3) Click on Refresh button from Operation Toolbar.



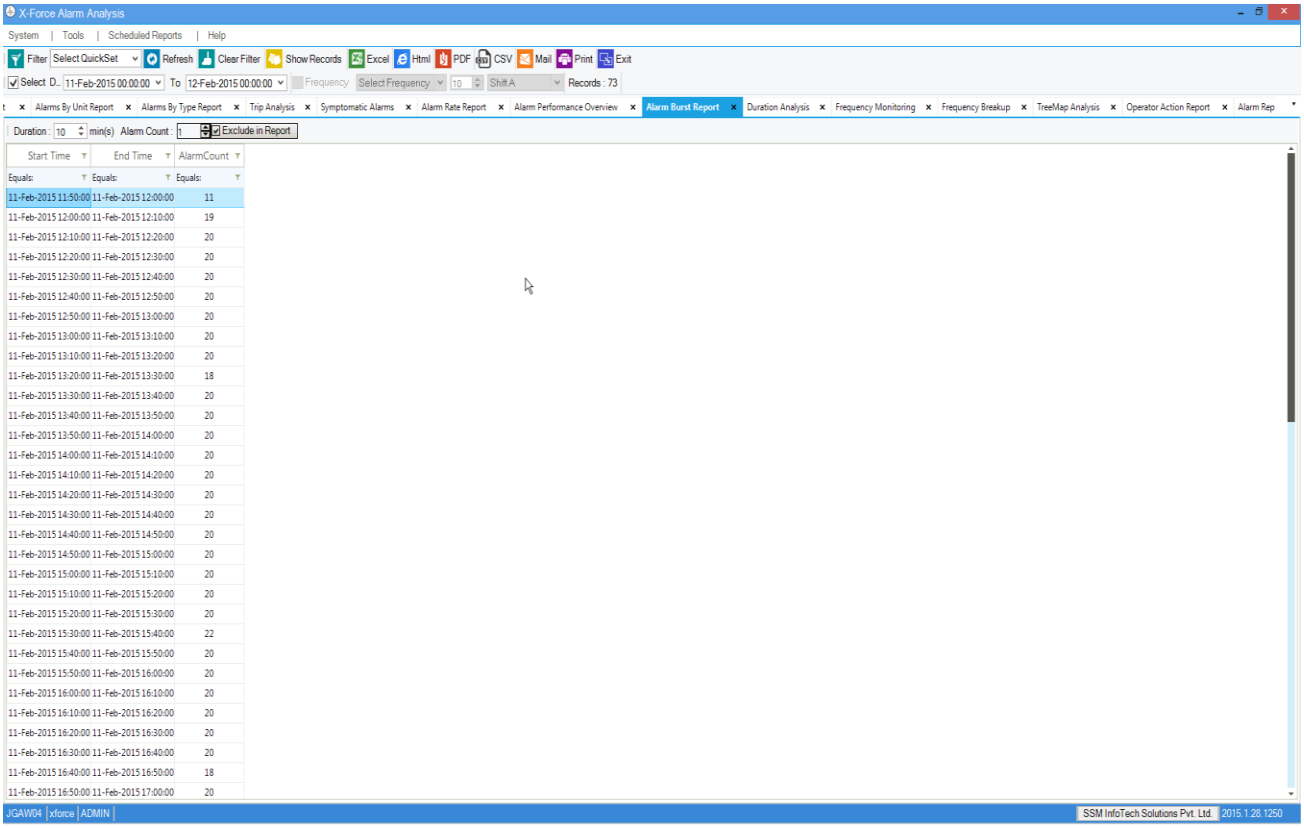
Alarm Burst

The **Alarm burst** analysis present the Rush of Alarm events for the specified time Period.

Alarm Burst report allows to do analysis of data in 10 minutes Slots. It represent the alarm flow for each 10 minutes for the given time duration.

Alarm Burst = Alarm per 10 minutes.

Navigation: Report Menu -> General Reports -> Alarm Burst



To analyze Alarm Burst: Follow Steps as mention below to do Analysis with Alarm Burst Report.

1) Go to Reports Menu and select General Reports, in that select Alarm Burst Report and click on it.
2) Select Start Date and End Date Parameters from Criteria Toolbar
3) Duration Box allows to select duration in minutes to do the slots for the analysis. By default duration is 10 minutes.
4) Alarm count box allow you to select the count which you want to exclude or include in Report.i.e if alarm Count = 3 and Exclude in report is checked than it will display only that slot of duration which has Alarm count greater than 3.
5) Click on Refresh button from Operation Toolbar.

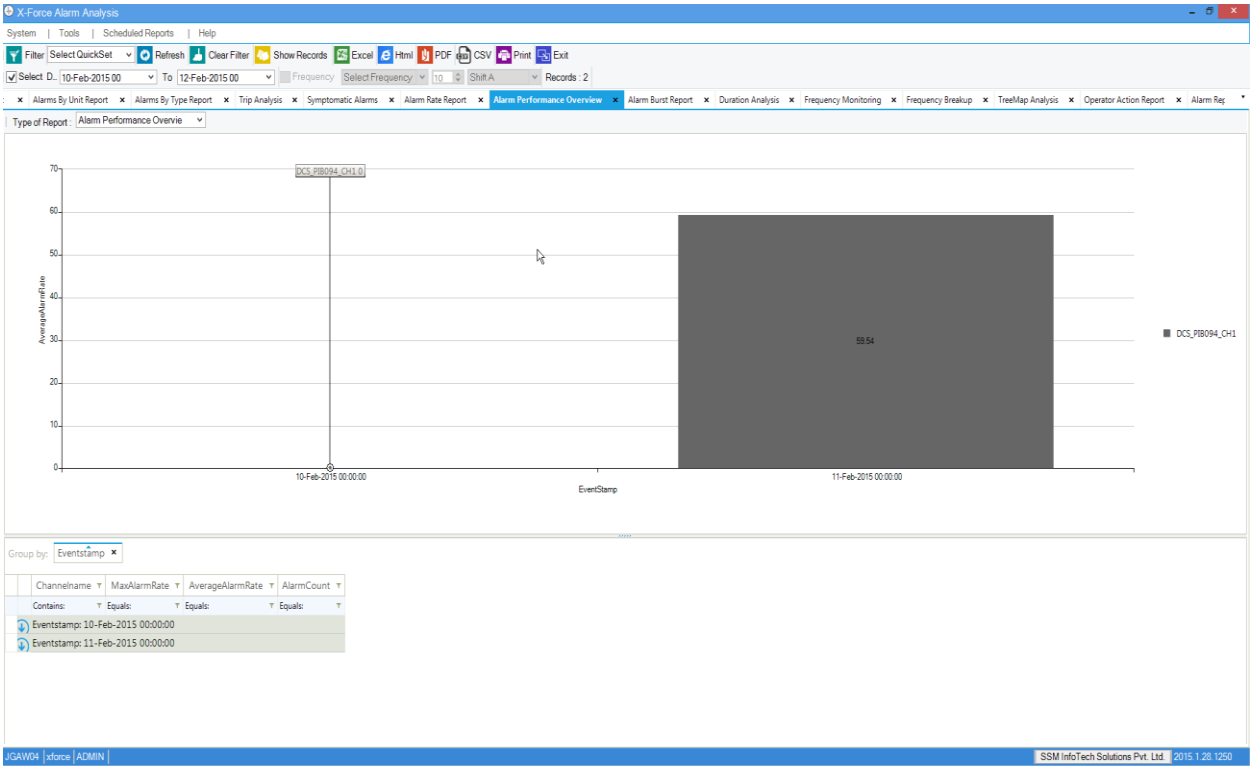
Alarm Performance overview

The **Alarm Performance overview** present the day/hour wise alarm Activity analysis .it will display daily/hourly alarm Rate, Average alarm rate ,total alarm Occurrence ,etc.

Navigation: Report Menu -> Alarm system Performance -> Alarm Performance overview

To analyze Alarm Performance Overview: Follow Steps as mention below to do Analysis with Alarm Performance Overview Report.

1) Go to Reports Menu and select General Reports, in that select Alarm Performance Report and click on it.
2) Select Start Date and End Date Parameters from Criteria Toolbar
3) Select the type of analysis you want to do among: 1) alarm Performance overview (represent the daily analysis) and 2) Hourly performance overview (represent the hourly analysis).
4) Click on Refresh button from Operation Toolbar.



Alarm Rate

The **Alarm Rate** analysis Present day wise Rate of Alarm Events for the Specified Month Duration

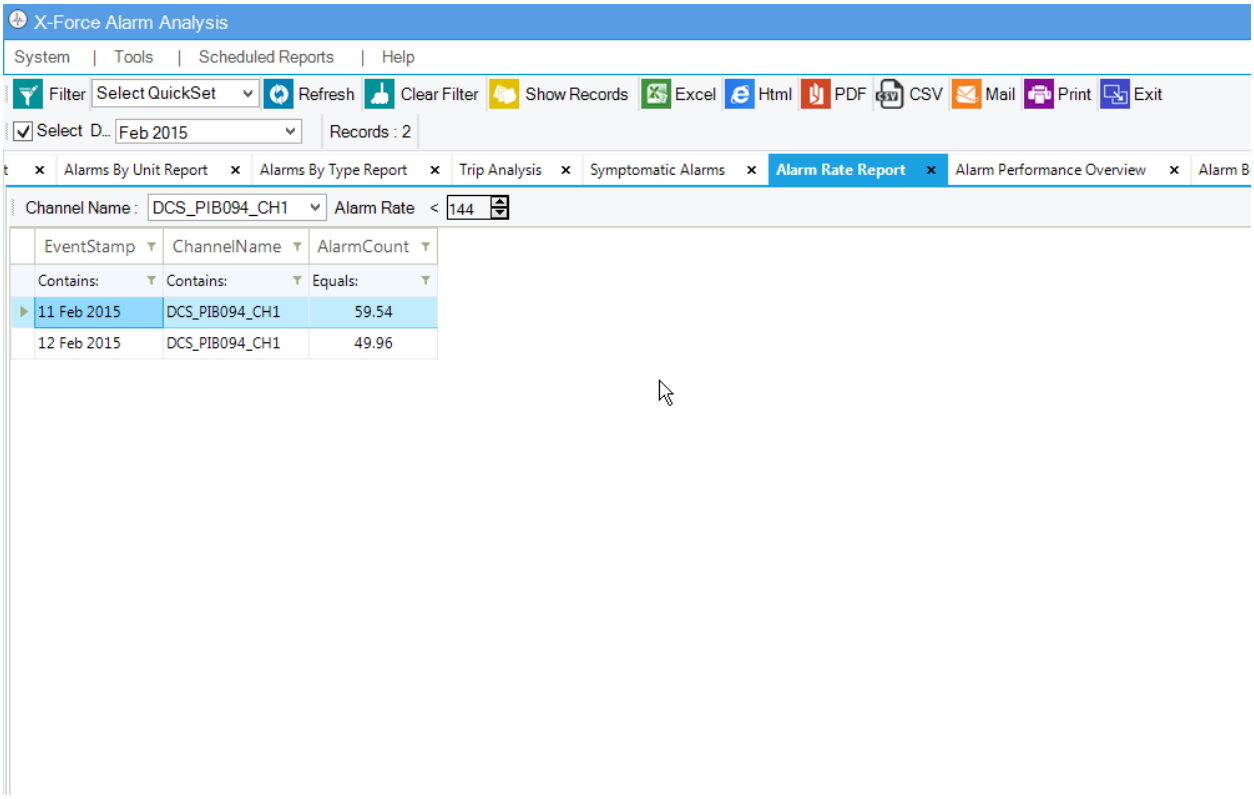
Alarm Rate is the daily analysis of alarm .it helps to know the flow of alarm on daily basis.

Navigation: Report Menu -> General Reports -> Alarm Rate

To analyze Alarm Rate: Follow Steps as mention below to do Analysis with Alarm Rate Report.

1) Go to Reports Menu and select General Reports, in that select Rate Report and click on it.
2) Select Start Date and End Date Parameters from Criteria Toolbar
3) Select the month for which you want to do Daily alarm rate analysis.
4) In alarm Rate you can select the alarm rate.

5) Click on Refresh button from Operation Toolbar.



Symptomatic Alarms

The **Symptomatic Alarms** Revels the symptoms of alarm activity relevant to the Tagname with all alarm details .it display tags and its concurrent activity before and after any particular Tagname.

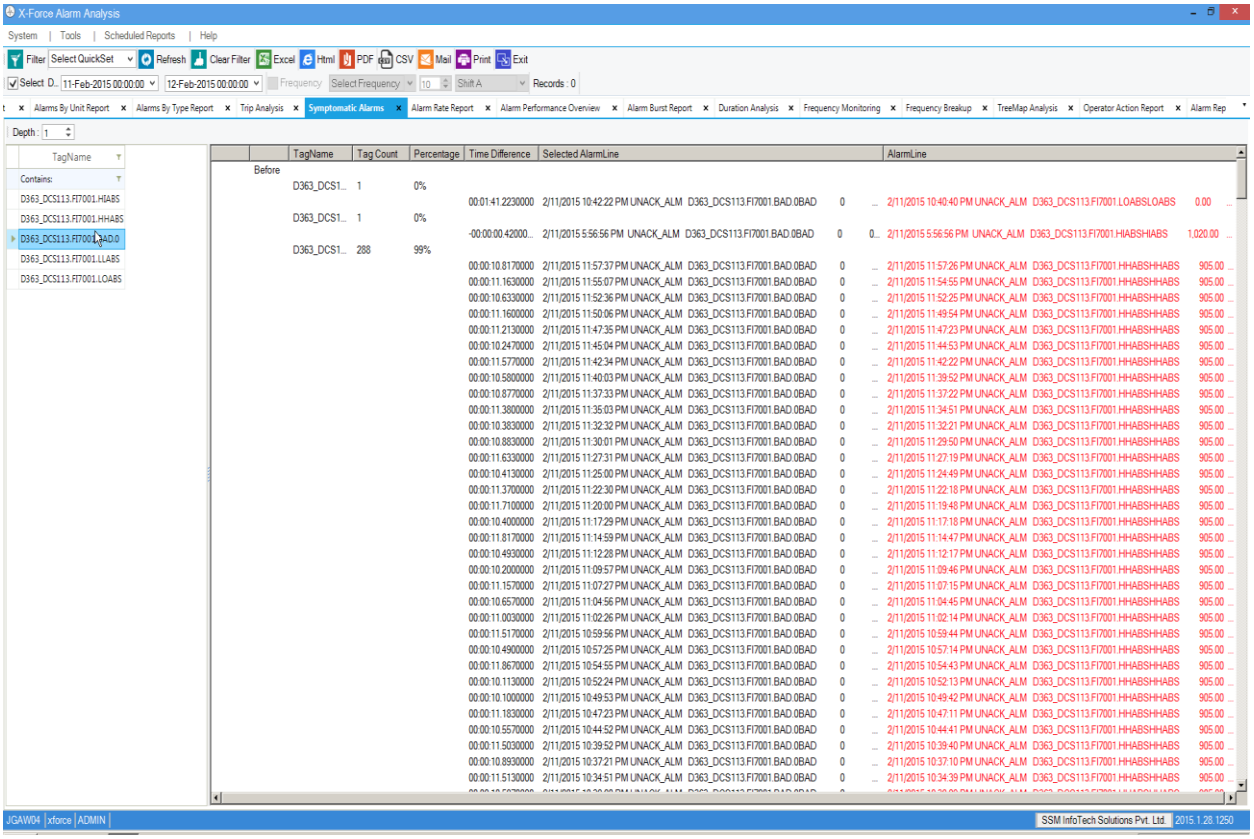
This Report displays symptoms of alarm‘s events that is useful to analysis for further process.

Symptomatic Alarm Report displays tags and its concurrent listing of before and after data

Navigation: Report Menu -> General Reports -> Symptomatic Alarms

To analyze Symptomatic Alarms: Follow Steps as mention below to do Analysis with Symptomatic Alarms.

1) Go to Reports Menu and select General Reports, in that select Symptomatic Alarms Report and click on it.
2) Select Start Date and End Date Parameters from Criteria Toolbar.
3) Click on Refresh button from Operation Toolbar



Trip analysis

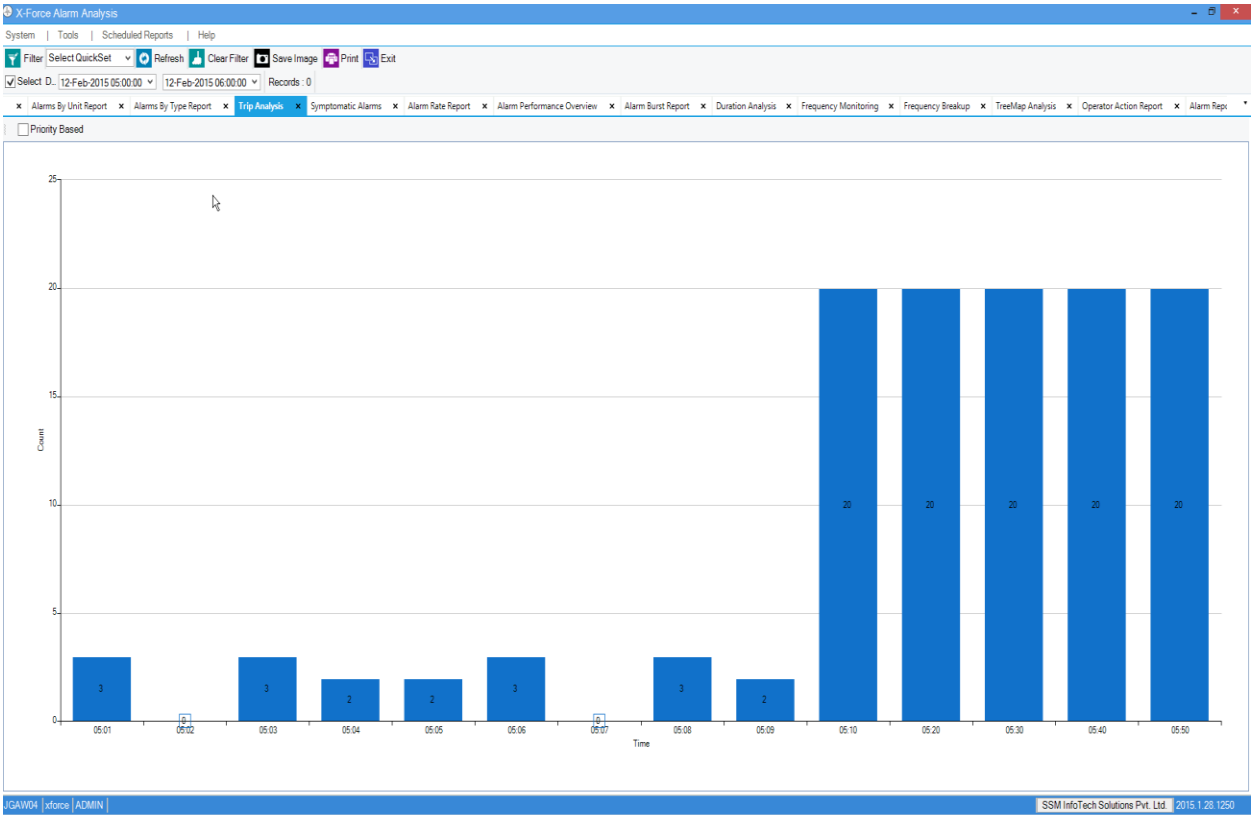
The **Trip analysis** graphically represent the Data of one hour in slots of minutes with total alarm occurrences.

Trip analysis report displays data of 1 hour .in that it displays first 10 minutes and then shows data of every 10 minutes in priority and count based.

Navigation: Report Menu -> General Reports -> Trip analysis

To analyze Trip analysis: Follow Steps as mention below to do Analysis with Trip analysis.

1) Go to Reports Menu and select General Reports, in that select Trip analysis Report and click on it.
2) Select Start Date and End Date Parameters from Criteria Toolbar.
3) Click on Refresh button from Operation Toolbar



Alarm System Performance Reports

Alarm by Type

The **Alarm by Type** analysis summarizes alarm activities per alarm parameter for the specified time period.

Navigation: Report Menu -> Alarm system Performance -> Alarm by Type

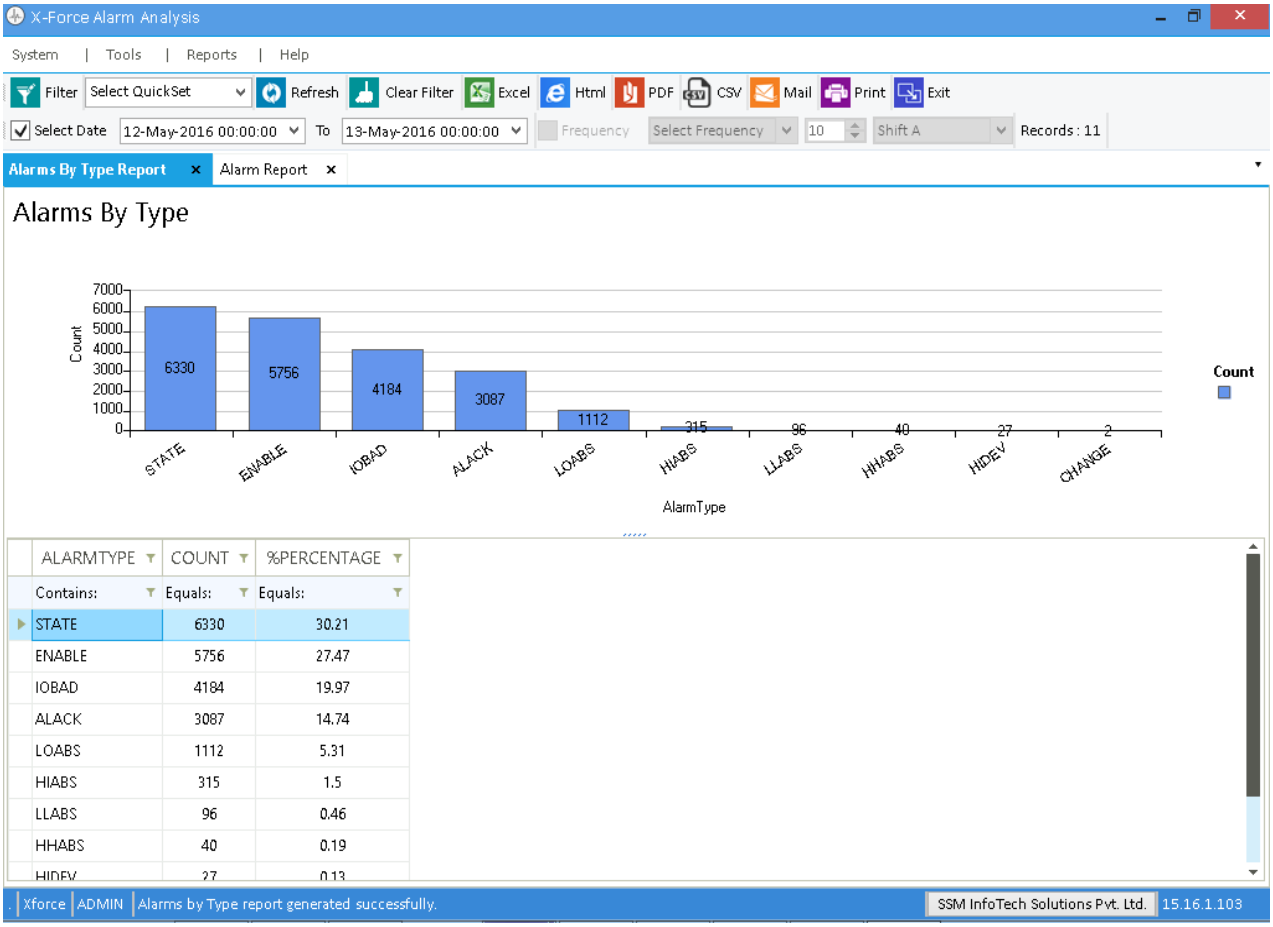
To analyze Alarm by Type: Follow Steps as mention below to do Analysis with Alarm by Type Report.

1) Go to Reports Menu and select Alarm System Performance, in that select Alarm by Type Report and click on it.
2) Select Start Date and End Date Parameters from Criteria Toolbar
3) Click on Refresh button from Operation Toolbar.

The analysis results include the alarm parameter(s) (e.g., LL, HH, LO, etc., for Yokogawa, IOBAD, HIABS, etc., for Foxboro), and for each parameter, the number of alarm events and the corresponding percentage of the total number of alarm events. The analysis also displays the total number of alarm events.

Detail Description of Analysis:

Alarm Type	Represent Alarm Parameter (e.g., LL, HH, LO, etc., for Yokogawa)
Count	Number of Alarm events for particular Parameter
Percentage	(Sum of total no of Events / number of alarm events for particular Parameter) *100



Count Verification Method:

- Use below query to find Alarm type wise total count

```
Select count (*) from vw_data_alarm_field where alarmtype ='LOABS' and eventstamp between '12-May-2016 00:00:00' and '13-May-2016 00:00:00' and msgtype = 'alm'
```

  - In above query put alarm type value for which you want to match count (here it is LOABS) and event stamp should be the Duration of Date for which you are doing analysis in report. This query will return total count for LOABS alarm type which is represented as Count in Report.

- Above query will return Alarm type Wise Total Count

- **Use below query to find total alarm count**

```
Select count (*) from vw_data_alarm_field where eventstamp between '12-May-2016 00:00:00' and '13-May-2016 00:00:00' and msgtype = 'alm'
```

- Above query will return total alm count

- **Formula for % Calculation**
  - **Percentage =** (Alarm type wise total count / total alarm count)*100

Alarm by Unit

The **Alarm by Unit** analysis reveals important details about alarm events for each unit during the given time period.

Note: This analysis is not available for all systems.

Navigation: Report Menu -> Alarm system Performance -> Alarm by Unit

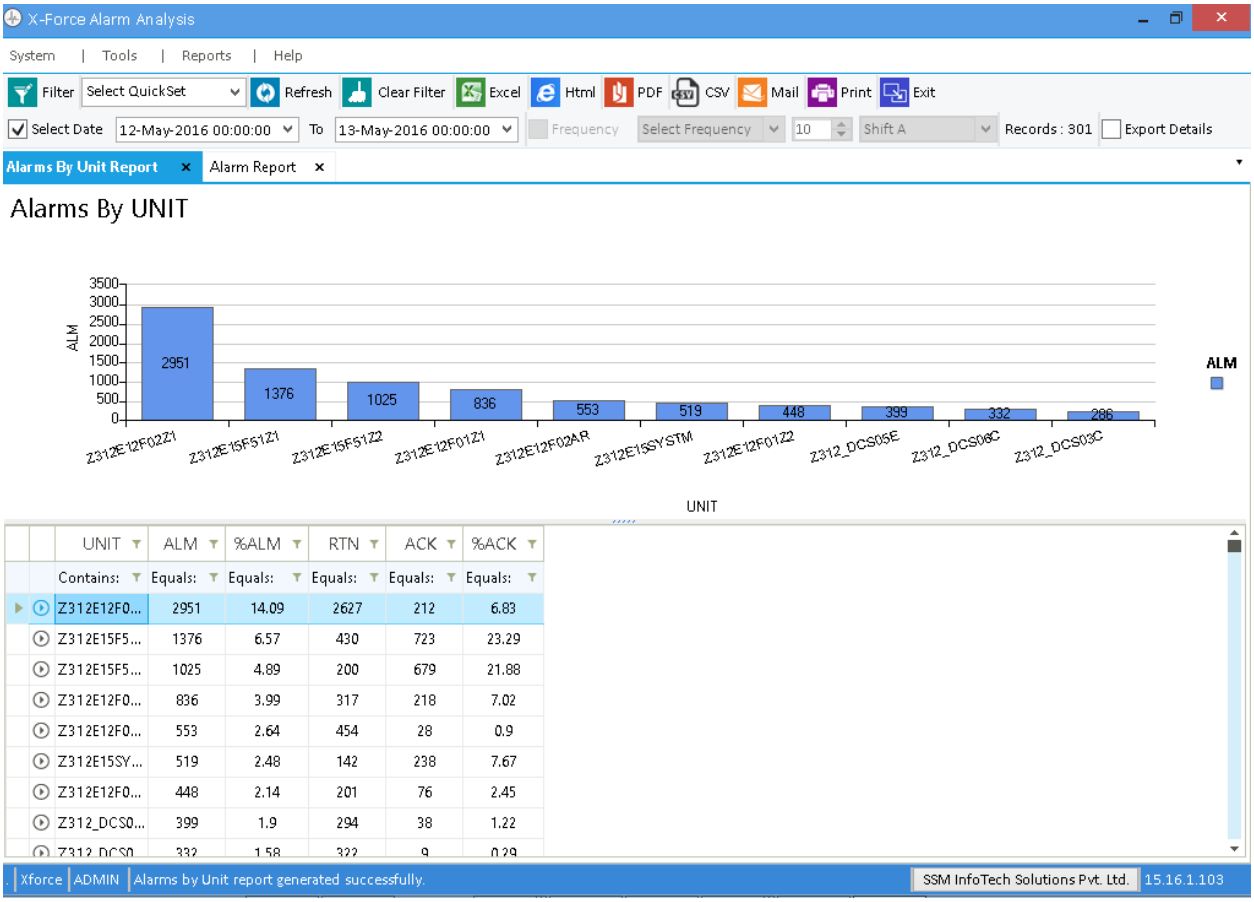
To analyze Alarm by Unit: Follow Steps as mention below to do Analysis with Alarm by Unit Report.

1) Go to Reports Menu and select Alarm System Performance, in that select Alarm by Unit Report and click on it.
2) Select Start Date and End Date Parameters from Criteria Toolbar
3) Click on Refresh button from Operation Toolbar.

The analysis result include a list of units, and for each unit, the number of alarm (ALM) events, the number of alarm return (RTN) events, the number of alarm acknowledge (ACK) events, and the ratio of ACK/ALM events. The analysis also displays the total number of ALM, RTN, and ACK events.

Detail Description of Analysis:

Unit	Represent Unit (e.g. STATE, IOBAD, etc. for Foxboro, KG/CM2, and %, etc. For Yokogawa.
ALM	no of Alarm events
%ALM	Sum of unit wise ALM events / sum of all Alarm events *100
RTN	no of RTN events
ACK	no of ACK events
%ACK	Sum of unit wise ACK events/ sum of all ACK events *100



Count Verification Method:

Alarm Flood

The **Alarm Flood** analysis summarizes alarm activities during flood periods .**Alarm Flood** is the phenomenon of presenting more alarms in a given period of time than a human operator can effectively respond. It specifies the amount of time, alarm system is in a flood condition in a specified time range

Navigation: Report Menu -> Alarm system Performance -> Alarm Flood

The **Alarm Flood** Report provides a mechanism to define the number of alarms that must occur with a specified number of minutes in order for the alarms to be considered a flood.

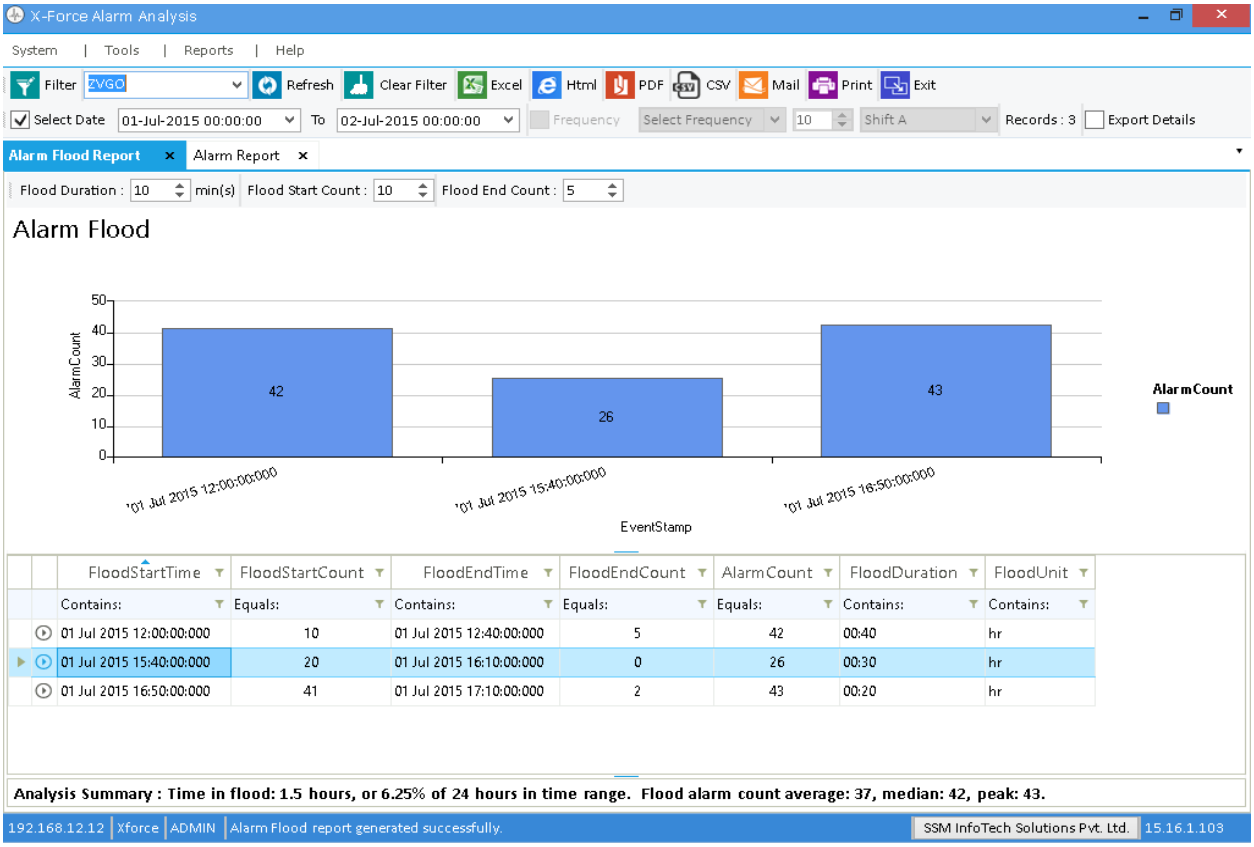
To analyze Alarm Flood: Follow Steps as mention below to do Analysis with Flood Report

1) Go to Reports Menu and select Alarm System Performance, in that select Alarm Flood Report and click on it.
2) Select Start Date and End Date Parameters from Criteria Toolbar

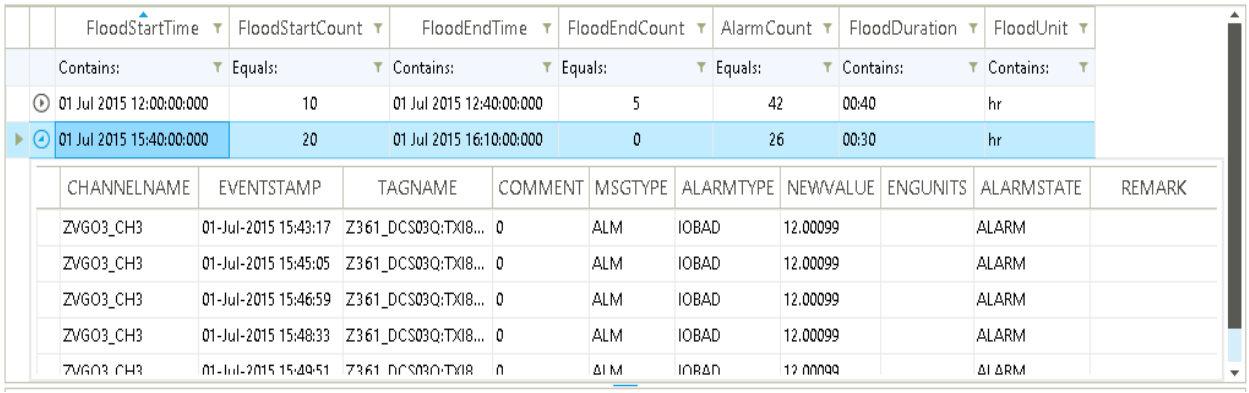
3) Type a value for the number of minutes that defines a flood period (Flood Duration which is by Default 10 mins) and a value for the number of alarms at which to begin the flood (Flood Start Count which is by default 10)
4) In the Flood End Count box , type a value for the number of alarms at which to end a flood (must be less than the Begin flood at value and by default it is 5)
5) Click on Refresh button from Operation Toolbar.

Detail Description of Analysis:

Flood start time	the time at which Alarm events occurrences exceed to the Flood start Count
Flood Start count	the number of alarms at which to begin the flood
Flood End Time	the time at which Alarm events occurrences drop to the value of Flood End Count
Flood End count	the number of alarms at which to end a flood
Alarm count	The no of alarm events between the Flood Start time and End time
Flood Duration	The time (in hours) for which flood Condition remains on system. Time Difference between Flood start Time and End Time.
Flood Unit	Specifies the duration for flood condition



The analysis results include the alarm Events Details for the alarms which occurs during the Alarm Flooding. Alarm details will be expanded by clicking on Expand button at the right side of the report.



FloodStartTime	FloodStartCount	FloodEndTime	FloodEndCount	AlarmCount	FloodDuration	FloodUnit
Contains:	Equals:	Contains:	Equals:	Equals:	Contains:	Contains:
01 Jul 2015 12:00:00:000	10	01 Jul 2015 12:40:00:000	5	42	00:40	hr
01 Jul 2015 15:40:00:000	20	01 Jul 2015 16:10:00:000	0	26	00:30	hr

CHANNELNAME	EVENTSTAMP	TAGNAME	COMMENT	MSGTYPE	ALARMTYPE	NEWVALUE	ENGUNITS	ALARMSTATE	REMARK
ZVGO3_CH3	01-Jul-2015 15:43:17	Z361_DCS03Q:TXI8...	0	ALM	IOBAD	12.00099		ALARM	
ZVGO3_CH3	01-Jul-2015 15:45:05	Z361_DCS03Q:TXI8...	0	ALM	IOBAD	12.00099		ALARM	
ZVGO3_CH3	01-Jul-2015 15:46:59	Z361_DCS03Q:TXI8...	0	ALM	IOBAD	12.00099		ALARM	
ZVGO3_CH3	01-Jul-2015 15:48:33	Z361_DCS03Q:TXI8...	0	ALM	IOBAD	12.00099		ALARM	
ZVGO3_CH3	01-Jul-2015 15:49:51	Z361_DCS03Q:TXI8	0	ALM	IOBAD	12.00099		ALARM	

Alarm Flood Analysis also provide summary of the report as display in below image.

Analysis Summary : Time in flood: 1.5 hours, or 6.25% of 24 hours in time range. Flood alarm count average: 37, median: 42, peak: 43.

In above Summary Line:

- **Time in Flood: 1 .5 hours** is total of flood Duration in hours (Here Calculation is : sum of flood duration which is 1.30.now convert .30 into hours i.e. 30/60 = 0.5 so total duration in hours is 1 + .5 = 1.5 hours)
- **6.25% of 24 Hours in time Range** represent total flood duration in percentage in the time range of Start Date and End date. (here calculation is : 1.5*100/24 = 6.25)
- **Flood alarm count average :37** represent the average of all flood alarm count
- **Median : 42** represent median of Flood count (median Calculation : sort all available Alarm Count values in Asc order and then middle value of among all is your median)
- **Peak: 43** represent maximum Flood Count Value.

Note: if Flood is not end in between the report time Duration than Flood end count will be consider as alarm count at the time of report end time.

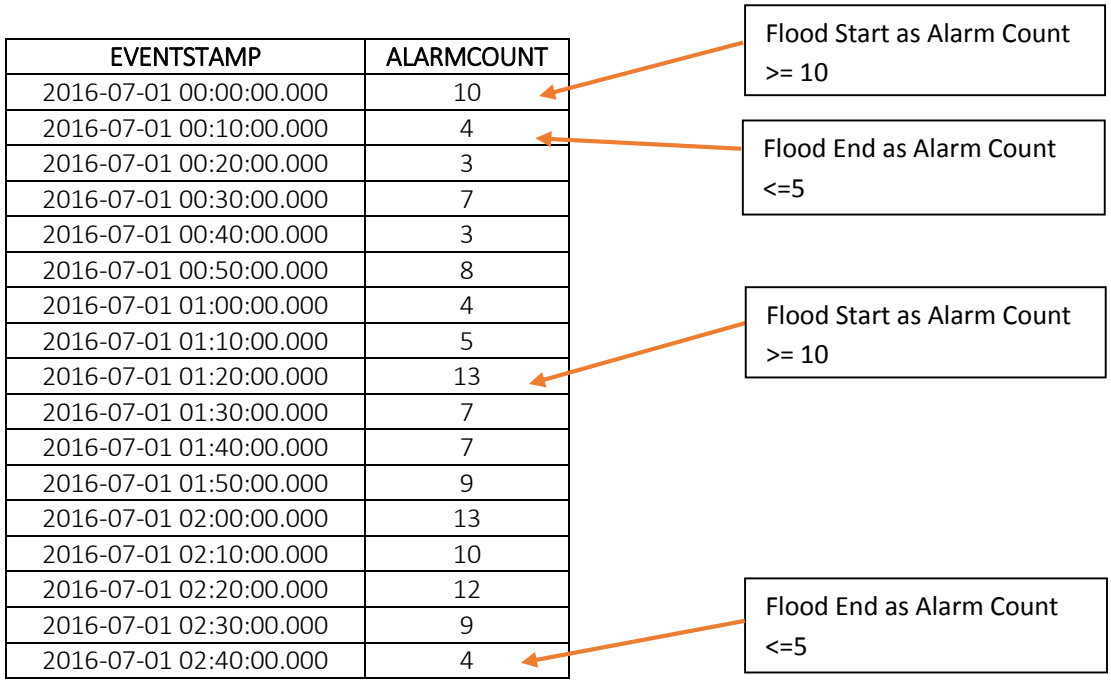
Count Verification Method:

- **Use below query to verify flood Report**

```
SELECT CONVERT(DATETIME,(REPLACE(CONVERT(VARCHAR(30), EVENTSTAMP, 106),'','-') +' '+
CONVERT(VARCHAR(2), DATEPART(HH, EVENTSTAMP)) + ':' + CONVERT(VARCHAR(2), (DATEPART(MI,
EVENTSTAMP)/10)*10))) AS EVENTSTAMP ,COUNT(*) AS ALARMCOUNT FROM
[Xforce].DBO.vw_data_alarm_field WHERE msgtype='alm' AND MSGTYPE='ALM' AND EVENTSTAMP BETWEEN
'01-jul-2016 00:00:00' AND '02-jul-2016 00:00:00' GROUP BY
CONVERT(DATETIME,(REPLACE(CONVERT(VARCHAR(30), EVENTSTAMP, 106),'','-')+' '+ CONVERT(VARCHAR(2),
DATEPART(HH, EVENTSTAMP)) + ':' + CONVERT(VARCHAR(2), (DATEPART(MI, EVENTSTAMP)/10)*10)))
```

The above query will return the alarm count for the specific time duration as below from which we can easily identify Flood start and Flood End time from the Alarm count in particular time Duration. From below result we can consider flood start time is when alarm count is greater than or equal to 10 (as specified in Flood start count parameter of report) and flood end time will be consider when alarm count is less than or equal to 5 (as specified in Flood End count parameter of Report) .

EVENTSTAMP	ALARMCOUNT
2016-07-01 00:00:00.000	10
2016-07-01 00:10:00.000	4
2016-07-01 00:20:00.000	3
2016-07-01 00:30:00.000	7
2016-07-01 00:40:00.000	3
2016-07-01 00:50:00.000	8
2016-07-01 01:00:00.000	4
2016-07-01 01:10:00.000	5
2016-07-01 01:20:00.000	13
2016-07-01 01:30:00.000	7
2016-07-01 01:40:00.000	7
2016-07-01 01:50:00.000	9
2016-07-01 02:00:00.000	13
2016-07-01 02:10:00.000	10
2016-07-01 02:20:00.000	12
2016-07-01 02:30:00.000	9
2016-07-01 02:40:00.000	4



Alarm per Time Period

The **Alarm per Time Period** analysis summarizes alarm activities based on define duration interval. This report will specify the alarm occurrence in particular time interval in context with Priority and ALM, RTN, ACK Message type. In simple terms the alarm per Time Period will represent the frequency of ALM, RTN, ACK, Priority (As per Configuration) in specific duration interval (As selected in report parameter .default is 60 Minutes.)

Navigation: Report Menu -> Alarm system Performance -> Alarm per Time Period

To analyze Alarm per Time Period: Follow Steps as mention below to do Analysis with Alarm per Time Period Report

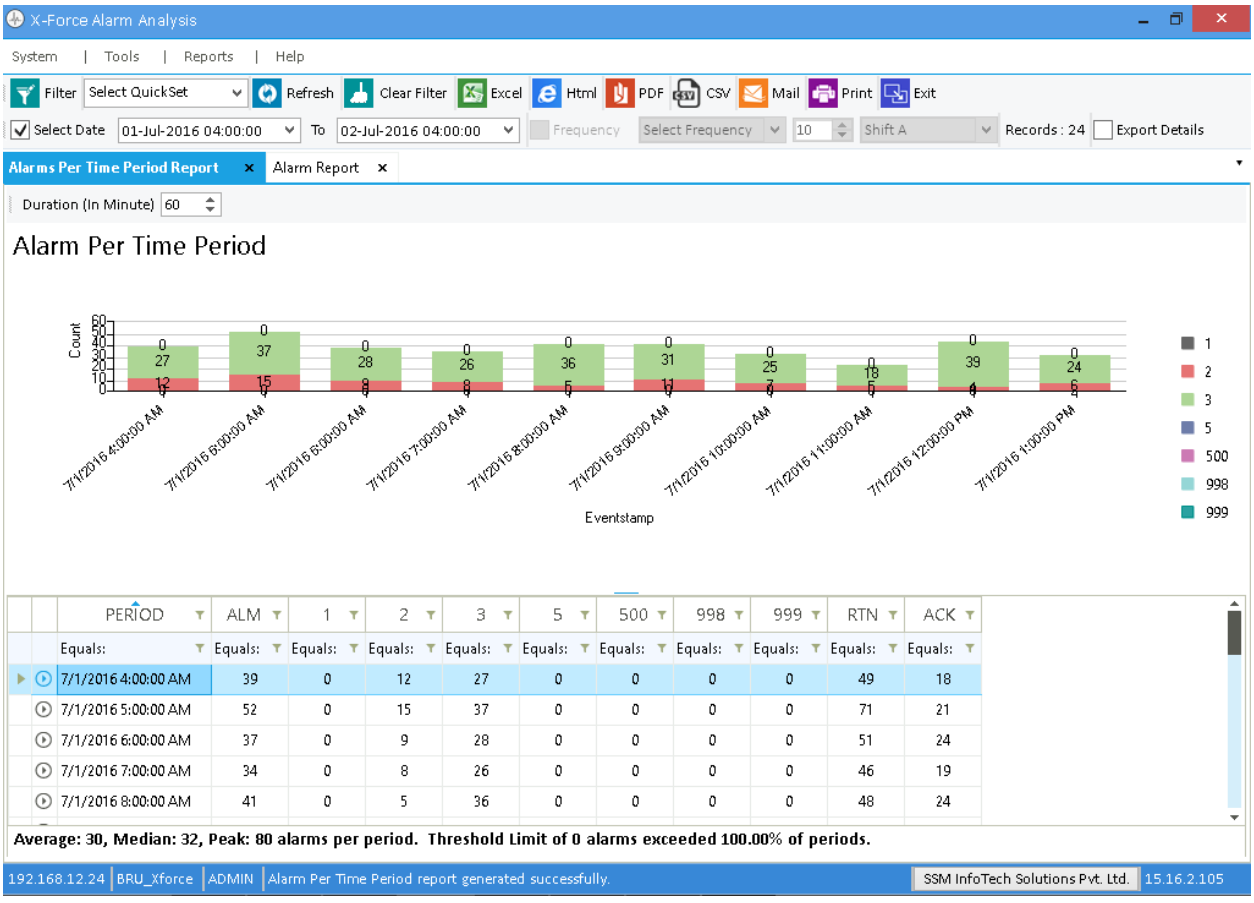
1) Go to Reports Menu and select Alarm System Performance, in that select Alarm per Time Period Report and click on it.
2) Select Start Date and End Date Parameters from Criteria Toolbar
3) Type Duration for time Interval (duration unit will be minutes)

4) Click on Refresh button from Operation Toolbar.

Detail Description of Analysis:

Period	Time Period for analysis. this will be divided as per the selected Duration interval
ALM	Frequency of for the Alarm events
1	Alarm occurrence for the 1.here 1 is the priority
2	Alarm occurrence for the 2 here 2 is the priority
3	Alarm occurrence for the 3.here 3 is the priority
5	Alarm occurrence for the 5.here 5 is the priority
500	Alarm occurrence for the 500.here 500 is the priority
998	Alarm occurrence for the 998 .here 998 is the priority
999	Alarm occurrence for the 999.here 999 is the priority
RTN	Alarm occurrence for Return Alarm events
ACK	Alarm occurrence for the ACK Alarm events.

In this report priority (1, 2, 3, 500, etc.) may be differ as per the Configuration.



The analysis results include the alarm Events Details for the alarms which occurs during the Particular Time Period. Alarm details will be expanded by clicking on Expand button at the right side of the report. Alarm per Time Period Analysis also provide summary of the report as display in below image.

In above Summary Line:

- **Average** is Average of all period ALM Count.
- **Median** is the Middle value among all Period of ALM Count.
- **Peak** is the Maximum among all period count of ALM Count.

Note: if Priority parameter is not vacant for Alarm events than this report will not be generated.

Count Verification Method:

- **Use below query for Each field count Verification**

```
Select count (*) from vw_data_alarm_field where msgtype= 'alm'and eventstamp between '01-Jul-2016 04:00:00' and '01-Jul-2016 05:00:00'
```

Above query will return total alarm count for specific duration.to verify other field Data, it is required to change filter .filter for other field is as below:
RTN -> Msgtype = 'RTN'
ACK -> Msgtype = 'ACK'
1 -> Priority = '1' or Priority in ('1')

Alarm Summary

The **Alarm Summary** analysis presents a comprehensive summary of alarm performance by running several different analyses over a specified time range. The summary data includes alarms per time period analysis, priority distribution, flood periods, chattering alarms, and operator changes. The resulting data is presented in a single page report format for easy viewing.

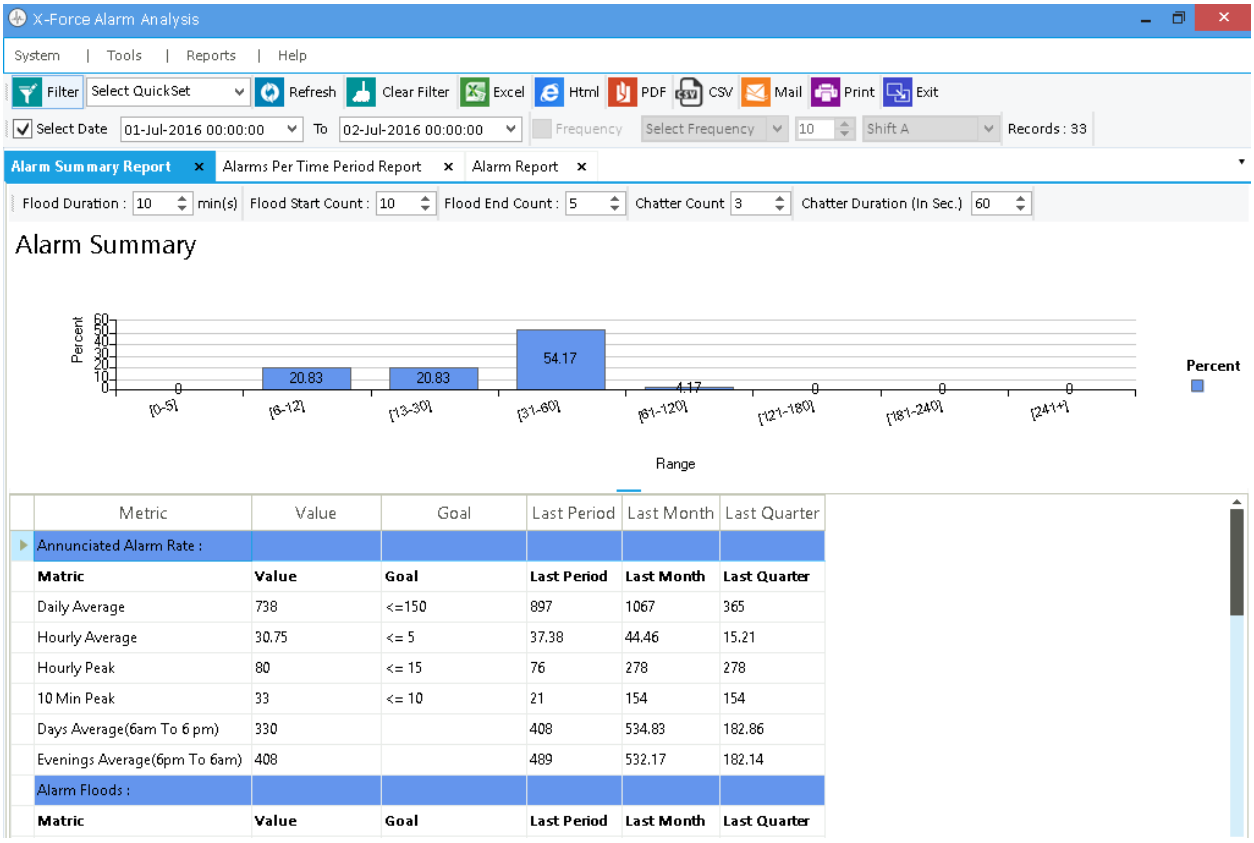
Navigation: Report Menu -> Alarm system Performance -> Alarm Summary

The **Alarm Summary** tab provides a mechanism to configure what goal value should be displayed for each metric on the **Alarm Summary** analysis. This allows you to quickly see where a metric's value is not equal to its goal value when viewing the **Alarm Summary** analysis.

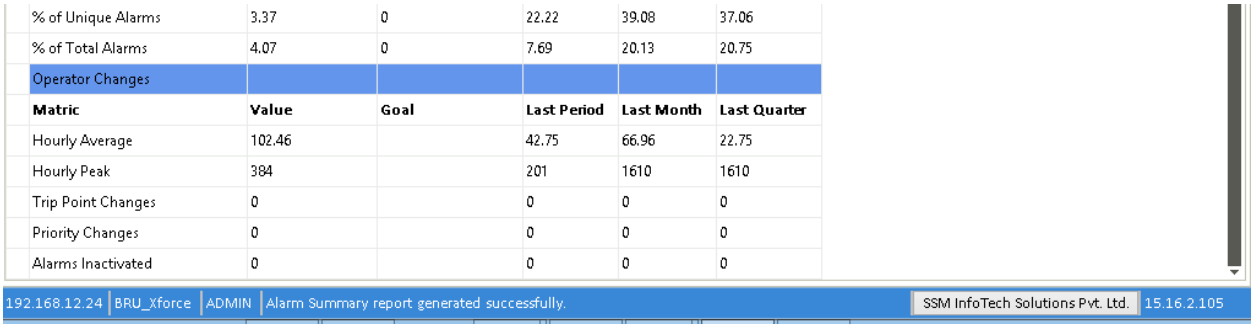
To analyze Alarm Summary: Follow Steps as mention below to do Analysis with Alarm Summary Report

1) Go to Reports Menu and select Alarm System Performance, in that select Alarm Summary Report and click on it.
2) Select Start Date and End Date Parameters from Criteria Toolbar

3) Select Flood Duration, Flood start Count, Flood End Count, Chatter count and Chatter duration Parameter.
4) Click on Refresh button from Operation Toolbar.



Metric	Value	Goal	Last Period	Last Month	Last Quarter
Annunciated Alarm Rate :					
Matric	**Value**	**Goal**	**Last Period**	**Last Month**	**Last Quarter**
Daily Average	738	<=150	897	1067	365
Hourly Average	30.75	<= 5	37.38	44.46	15.21
Hourly Peak	80	<= 15	76	278	278
10 Min Peak	33	<= 10	21	154	154
Days Average(6am To 6 pm)	330		408	534.83	182.86
Evenings Average(6pm To 6am)	408		489	532.17	182.14
Alarm Floods :					
Matric	**Value**	**Goal**	**Last Period**	**Last Month**	**Last Quarter**
Time in Floods	5.51		7.99	290.24	297.75
% Time in Floods	22.96		33.29	40.31	13.78
Avg Flood Events	37.3		46.17	84.54	82.18
Peak Flood Events	93	<= 20	170	1994	1994
Longest Duration	1.17		2.17	12.67	12.67
Annunciated Priorities :					
Matric	**Value**	**Goal**	**Last Period**	**Last Month**	**Last Quarter**
% Emergency	0.81	<= 5%	1.45	0.12	0.12
% High	22.49	approx. 15%	23.97	20.58	20.28
% Low	76.69	approx. 80%	74.58	78.98	79.28
Chattering Alarms					
Matric	**Value**	**Goal**	**Last Period**	**Last Month**	**Last Quarter**
# of Chattering alarms	3	0	10	102	106
# of Occurances	30	0	69	6447	6832



% of Unique Alarms	3.37	0	22.22	39.08	37.06
% of Total Alarms	4.07	0	7.69	20.13	20.75
Operator Changes					
Matric	**Value**	**Goal**	**Last Period**	**Last Month**	**Last Quarter**
Hourly Average	102.46		42.75	66.96	22.75
Hourly Peak	384		201	1610	1610
Trip Point Changes	0		0	0	0
Priority Changes	0		0	0	0
Alarms Inactivated	0		0	0	0

Metrics are presented in a grid for the following categories: Annunciated Alarm Rate, Annunciated Priority, Alarm Floods, Chattering Alarms, and Operator Changes. For each metric, the grid includes six columns:

Metric - the name of the metric calculated on that row. See the following table for the metrics included for each category. See the table below for a list of the metrics displayed for each category.

Value - the value of the metric over the period defined as the rolling period in the parameter set.

Goal - a text string you define in the parameter set stating the goal value for the metric

Last Period - the value for the metric over the previous period.

Last Month - the value for the metric calculated over the last fully completed calendar month. For example, if you run the analysis with a *Run for time* of September 8, the Last Month will be calculated for the month of August.

Last Qtrs. - the value for the metric calculated for the last fully completed calendar quarter
For example, if you run the analysis with a *Run for time* of September 8, the Last Qtrs. will be calculated for the last April-June quarter).

Category	Metrics Displayed
Annunciated Alarm Rate	**Daily Average** - Number of alarm events per day averaged for the specified time range. **Hourly Average** - Number of alarm events per hour averaged for the specified time range. **Hourly Peak** - The max number of alarm events in a given hour for the specified time range. **10 Min Peak** - The max number of alarm events in a given 10 minute period for a specified time range. **Days Average (6am-6pm)** - The number of alarm events averaged for the day shift for the specified time range. **Evenings Average (6pm-6am)** - The number of alarm events averaged for the night shift for the specified time range.
Alarm Floods	**Time in Floods** - The amount of time the alarm system is in a flood condition in a specified time range. Floods start when the alarm system exceeds 10 alarm events / 10 minutes and ends when the alarm system drops below 5 alarm events / 10 minutes. **% Time in Floods** - The percent of time the alarm system is in a flood condition divided by total time in the specified time range.

	Avg Flood Events - This is the average number of alarm events during all the flood periods for the specified time range. **Peak Flood Events** - This is the max number of alarm events during all the flood periods for the specified time range. **Longest Duration** - This is the time for the longest flood.
Annunciated Priorities	**% Emergency** - Percentage of alarm events that are an emergency priority (Priority 1) divided by the total number of alarm events **% High** - Percentage of alarm events that are a high priority (Priority 2) divided by the total number of alarm events **% Low** - Percentage of alarm events that are a low priority (Priority 3, 4, and 5) divided by the total number of alarm events
Chattering Alarms	**# Of Chattering Alarms** - Total unique alarms that have at least one sequence of activations that qualifies as "Chattering" within the time range. **# of Occurrences** - Total number of alarm events that are included in the identified chattering alarms **% of Unique Alarms** - Total from item (a.) divided by the total unique alarms in the data set for that time range **% of Total Alarms** - Total from item (b.) divided by the total number of alarm events in the data set for that time range.

Count Verification Method:

- Use Below table as reference to verify Alarm summary data

		VALUE	Last Period	Last Month	Last, Quarter
		Start: 31-Mar-2014 00:00:00	Start: 30-Mar-2014 00:00:00	Start: (End date – 30)	Start: (End – 90 Days)
		End: 1-Apr-2014 00:00:00	End: 31-Mar-2014 00:00:00	End: 1-Apr-2014 00:00:00	End: 1-Apr-2014 00:00:00
Annunciated Alarm Rate					
1	Daily Average	Total No of **alarm** Count for 24Hrs/1	Total No.of **alarm** Count for 24Hrs / 1	Total Number of alarm count for last 30 days/30	Total Number of alarm count for last 90 days/90
2	Hourly Average	Daily Average/24	Daily Average/24	Daily average of last 30 days /(24)	Daily average of last Quarter /(24)
3	Hourly Peak	Max of last 24Hrs. hourly count	Max of last 24Hrs. hourly count	Max of last 30 days hourly count	Max of last 90 days hourly count
4	10 Min Peak	Max of last 24Hrs. 10Mins count	Max of last 24Hrs. 10Mins count	Max of last 30 days 10Mins count	Max of last 90 days 10Mins count

5	Days Average (6am-6pm)	(Total number of alarm count from 31 march 2014 06:00:00 to 31 March 18:00:00)/1 or vice versa	(Total number of alarm count from 30 march 2014 06:00:00 to 30 March 18:00:00)/1 or vice versa	Sum of day average of last month /30 or vice versa	Sum of day average of last quarter /90 or vice versa
6	Evenings Average (6pm-6am)	Daily average - day average or vice versa	Daily average of last period - Day average of last period or vice versa	Daily average of last month - Day average of last Month or vice versa	Daily average of last quarter - Day average of last quarter or vice versa
1	Time in Floods (hours Calculation: HH+MM/60+ SS/3600)	Total Hrs. Alarm System in Flood (in hrs.) (It will be sum of all Flood Events Duration in Hrs.)	Total Hrs. Alarm System in Flood for last period (It will be sum of all Flood Events Duration in Hrs.)	Total Hrs. Alarm System in Flood for 30 days (It will be sum of all Flood Events Duration in Hrs.)	Total Hrs. Alarm System in Flood for 90 days (It will be sum of all Flood Events Duration in Hrs.)
2	% Time in Floods	(Time in flood / 24 hrs.)*100	(Time in flood for last period / 24 hrs.)*100	(Time in flood for last Month / (30* 24) hrs.)*100	(Time in flood for last Quarter / (90* 24) hrs.)*100
3	Average Flood Events	(Sum of Alarm Count (i.e. sum of All Flood Events Counts) /No. Of Rows i.e. No. of Flood Events	(Sum of Alarm Count (i.e. sum of All Flood Events Counts) of Flood Report)/No. Of Rows i.e. No. of Flood Events for last period	(Sum of Alarm Count (i.e. sum of All Flood Events Counts) of Flood Report)/No. Of Rows i.e. No. of Flood Events for last month	(Sum of Alarm Count (i.e. sum of All Flood Events Counts) of Flood Report)/No. Of Rows i.e. No. of Flood Events for last Quarter
4	Peak Flood Events	Max Alarm Count of all flood events	Max Alarm Count of all flood events for last period	Max Alarm Count of all flood events for last month	Max Alarm Count of all flood events for last Quarter
5	Longest Duration	Flood Duration of Max Alarm Count from all Flood Events	Flood Duration of Max Alarm Count from all Flood Events for last period	Flood Duration of Max Alarm Count from all Flood Events for last month	Flood Duration of Max Alarm Count from all Flood Events for last Quarter
Annunciated Priorities					
1	% Emergency (Priority 1)	(Count of emergency Alarm of 24Hrs/Total No. of alarms of last 24hrs) * 100	(Count of emergency Alarm of yesterday /Total No. of alarms of last days) * 100	(Count of emergency Alarm of last 30 days /Total No. of alarms of last 30 days) * 100	(Count of emergency Alarm of last 90 days/Total No. of alarms of last 90 days) * 100

2	% High (Priority 2)	(Count of High Alarm/Total No. of alarms of last 24hrs) * 100	(Count of High Alarm of yesterday/Total No. of alarms of Last days) * 100	(Count of High Alarm of last 30 days /Total No. of alarms of last 30 days) * 100	(Count of High Alarm of last 90 days /Total No. of alarms of last 90 days) * 100
3	% Low (Priority 3,4,5)	(Count of Low Alarm/Total No. of alarms of last 24hrs) * 100	(Count of Low Alarm of yesterday /Total No. of alarms of Last days) * 100	(Count of Low Alarm of last 30 days /Total No. of alarms of last 30 days) * 100	(Count of Low Alarm of last 90 days /Total No. of alarms of last 90 days) * 100
Chattering Alarms					
1	# of Chattering Alarms	Last 24Hrs Unique chattering alarm counts i.e. No. Of Rows	Chattering alarm count as per above start and end date	Chattering alarm count as per above start and end date	Chattering alarm count as per above start and end date
2	# of Occurrences	Expanded View Count i.e. Total Chattering Alarm Instances count only	Expanded View Count i.e. Total Chattering Alarm Instances Count only for last period	Expanded View Count i.e. Total Chattering Alarm Instances Count only for last month	Expanded View Count i.e. Total Chattering Alarm Instances Count only for last Quarter
3	% of Unique Alarms	% of total unique alarms in the data set for Day	% of total unique alarms in the data set for last Period	% of total unique alarms in the data set for Last month	% of total unique alarms in the data set for last Quarter
4	% of Total Alarms	% of total number of alarm events in the data set for day	% of total number of alarm events in the data set for last Period	% of total number of alarm events in the data set for last month	% of total number of alarm events in the data set for last Quarter
Operator Changes					
1	Hourly Average	Hourly avg. for Operator Action =	Hourly avg. for Operator Action =	Hourly avg. for Operator Action =	Hourly avg. for Operator Action =
		Count of Hour wise for 24hrs / 24	Count of Hour wise of 24hrs for Yesterday/24	Count of Hour wise for Last 30 days/30*24	Count of Hour wise for Last 30 days/90*24
2	Hourly Peak	Max of Last 24hrs	Max of Yesterday 24hrs	Max of 24hrs for 30 days.	Max of 24hrs for 90 days.
3	Trip Point Changes	NA	NA	NA	NA
4	Priority Changes	NA	NA	NA	NA

5	Alarms Inactivated	NA	NA	NA	NA

Chattering Alarm Report

The **Chattering Alarm Report** identifies entities that generate a burst of alarm activity that cycles in and out of alarm very rapidly. The length of the alarm and the amount of alarms for the time period define the criteria for chattering alarms. This is defined for the chattering alarm report parameter tab configuration.

A typical chattering alarm is a temperature sensor that cycles in and out of alarm ten times within a minute. The detection of a chattering alarm requires a threshold for the number of alarms per time period. For optimum performance, chattering alarm should be configured for a rolling count of the number of alarms per time period.

Chattering alarms may also be called bad actors because of the possibility of a false alarm. Bad actors are chattering alarms that can distract the operator.

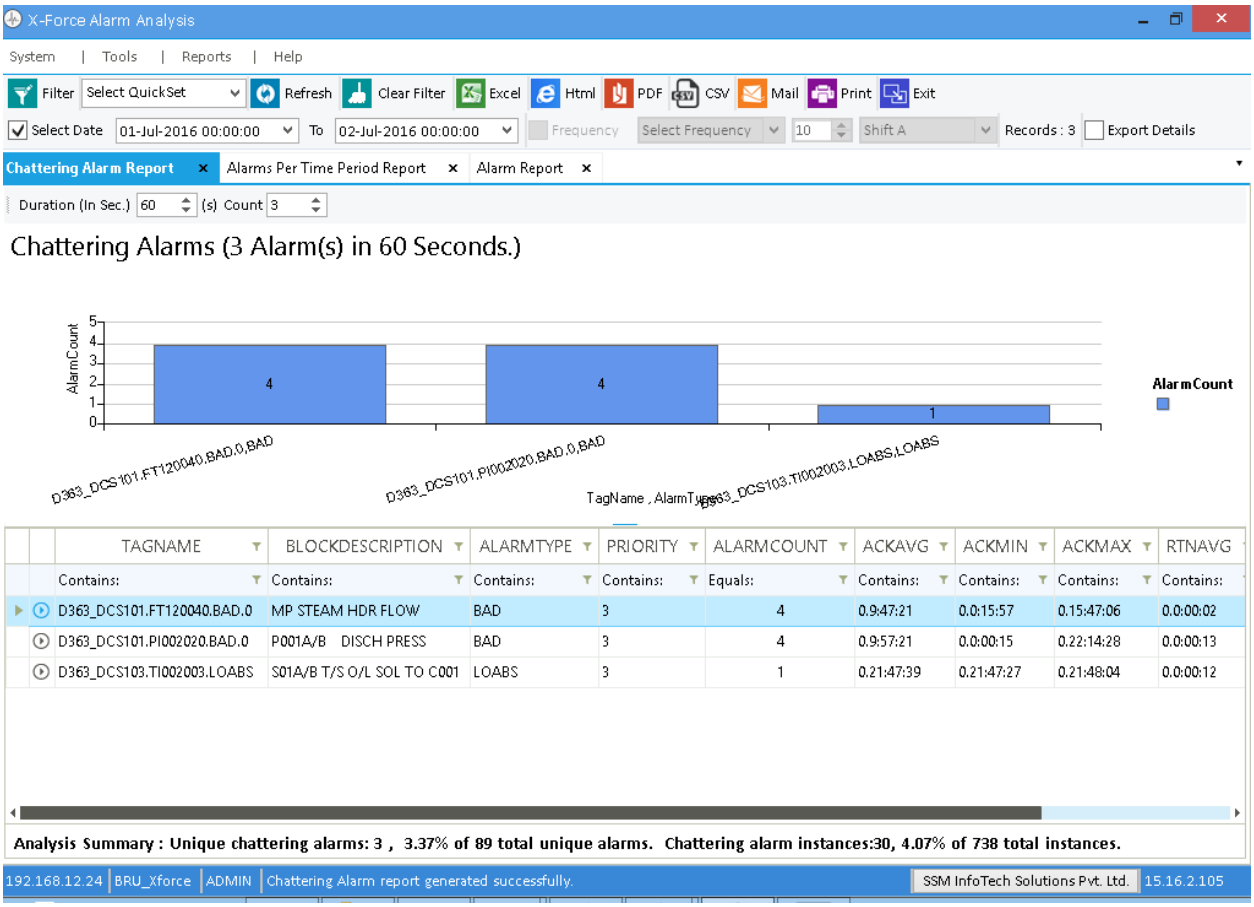
Navigation: Report Menu -> Alarm system Performance -> Chattering Alarm

To analyze Chattering Alarm: Follow Steps as mention below to do Analysis with Chattering Alarm Report

1) Go to Reports Menu and select Alarm System Performance, in that select Chattering Alarm and click on it.
2) Select Start Date and End Date Parameters from Criteria Toolbar
3) Enter specific number of minutes in order to be considered chattering in Duration (Default is 1 minutes)
4) Enter number of times an alarm must occur for burst in Count parameter for Chattering analysis (Default is 3)
5) Click on Refresh button from Operation Toolbar.

Detail Description of Analysis:

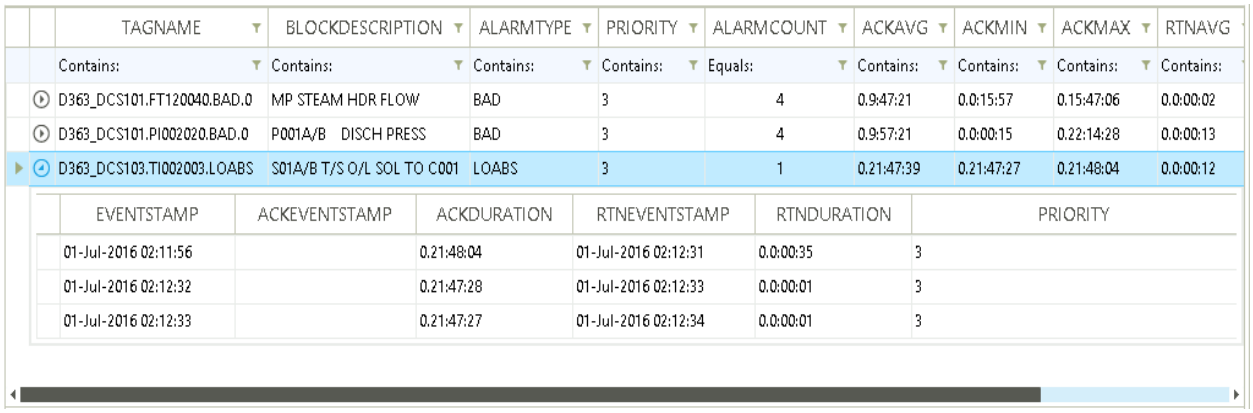
Tagname	This are the constraints of alarm Events Parameters for which chattering Cycle is occur
BlockDescription	
Alarmtype	
Priority	
AlarmCount	Sum of every Chattering Cycle.
ACKAVG	Average of ACK duration. This value will be calculated in day.HH.mm.ss format
ACKMIN	Minimum value of ACK duration. This value will be calculated in day.HH.mm.ss format
ACKMAX	Maximum value of ACK duration. This value will be calculated in day.HH.mm.ss format
RTNAVG	Average of RTN duration. This value will be calculated in day.HH.mm.ss format
RTNMIN	Minimum value of RTN duration. This value will be calculated in day.HH.mm.ss format
RTNMAX	Maximum value of RTN duration. This value will be calculated in day.HH.mm.ss format



The Chattering Configuration tab provides a mechanism to configure the number of times an alarm must occur over a specific number of minutes in order to be considered chattering. For example, you may consider all alarms that occurred three or more times in one minute to be chattering. For this example, when executing the Chattering Alarms analysis, only alarms that have occurred 3 times or more in one minute will be included in the analysis.

The analysis results include the alarm Events Details for the Chattering Alarm Cycle. Alarm details will be expanded by clicking on Expand button at the right side of the report.

Chattering Alarm analysis also display details of Each Cycle with below Details:



TAGNAME	BLOCKDESCRIPTION	ALARMTYPE	PRIORITY	ALARMCOUNT	ACKAVG	ACKMIN	ACKMAX	RTNAVG
Contains:	Contains:	Contains:	Contains:	Equals:	Contains:	Contains:	Contains:	Contains:
D363_DCS101.FT120040.BAD.0	MP STEAM HDR FLOW	BAD	3	4	0.9:47:21	0.0:15:57	0.15:47:06	0.0:00:02
D363_DCS101.PI002020.BAD.0	P001A/B DISCH PRESS	BAD	3	4	0.9:57:21	0.0:00:15	0.22:14:28	0.0:00:13
D363_DCS103.TI002003.LOABS	S01A/B T/S O/L SOL TO C001	LOABS	3	1	0.21:47:39	0.21:47:27	0.21:48:04	0.0:00:12

EVENTSTAMP	ACKEVENTSTAMP	ACKDURATION	RTNEVENTSTAMP	RTNDURATION	PRIORITY
01-Jul-2016 02:11:56		0.21:48:04	01-Jul-2016 02:12:31	0.0:00:35	3
01-Jul-2016 02:12:32		0.21:47:28	01-Jul-2016 02:12:33	0.0:00:01	3
01-Jul-2016 02:12:33		0.21:47:27	01-Jul-2016 02:12:34	0.0:00:01	3

Eventstamp	Event stamp of particular alarm event
ACKEventstamp	Acknowledge eventstamp of alarm event.
ACKDuration	Time difference between alarm and its Acknowledge event occurrence
RTNEventstamp	Return eventstamp of alarm event
RTNDuration	Time difference between alarm and its return event occurrence
Priority	Priority of alarm event

Chattering Alarm Analysis also provide summary of the report as display in below image.

In above Summary Line:

- **Unique Chattering Alarm 3** is no of Chattering cycle in between the specific time Duration.
- **3.37% of 89 Total Unique Alarms** represent unique Chattering alarm Frequency in percentage in the time range of Start Date and End date. (here calculation is : (3/89)* 100 = 3.37)
- **Chattering alarm instance: 30** represent the sum of all alarm occur in each Chattering Cycle.
- **4.07% of 738 total instances** represent frequency of chattering alarm in the time range of start date and end date (here calculation is : (30/738)*100= 4.07)

Count Verification Method:

- Consider one tag and find the alarm event occurrence for the same tag with in the 1 sec of same tag alarm event occurrence. If alarm and return event occurrence occur concurrently and this occurrence will be >= 3 than that alarm should be consider as Chatter alarm.
- Paring of Alarm and return event will be consider as one count while finding the Alarm Count for chattering Cycle.
- In simplest term Concurrent occurrences for paring of 3 or more than 3 Alarm and return event for the same tag will be consider as one Chatter.
- For any duration calculation in chattering report first we will find duration in second and then converted it in to day.HH: mm:ss format.

Note: if acknowledge or return not occur for any alarm event during the report generation time than report end time will be consider as ACKEventstamp or RTNEventstamp and rest of the calculations done accordingly. And if alarm not occur during the report generation time than report start time will be the eventstamp for any alarm .for the alarm which has no Acknowledge or return occur than its respective eventstamp value will be displayed blank.

Consequential Alarm Report

A **consequential alarm** becomes active as a result of another alarm. The Consequential Alarms analysis indicates entities that have gone into an alarm state and other entity/alarm combinations that became active before and after the alarm event.

Alarm consequence can be defined as the likelihood of one alarm to trigger one or more identified alarms. For example, a power fault in a plant power station may result in one or more alarms for the power station, and additional alarms for any equipment that is supplied power from that station. The main alarm is the parent alarm while the alarms triggered as a result of the parent are consequential alarms.

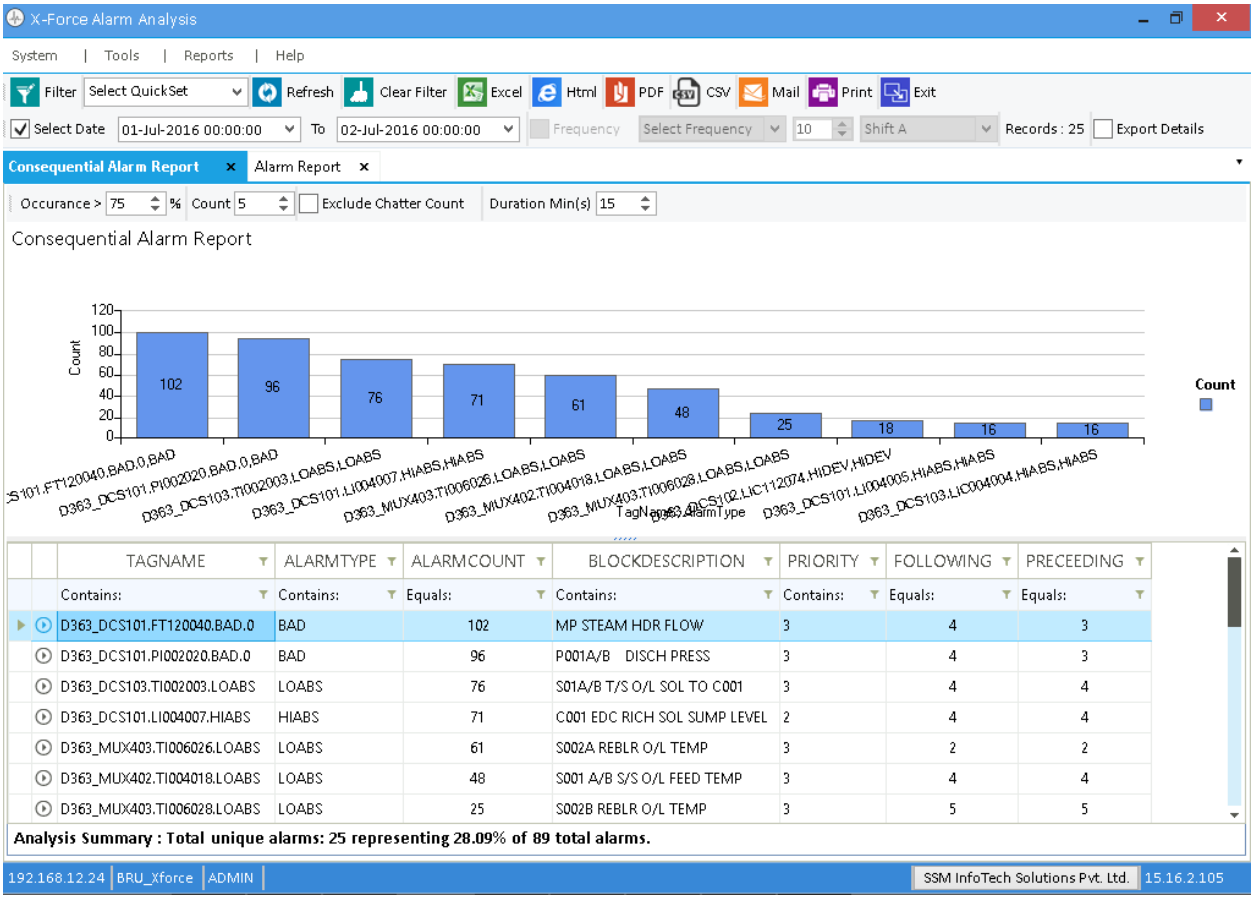
The **Consequential Report** allows the configuration of four criteria used in calculating which alarms should be considered consequential. For example, you may want only alarms occurring within 15 minutes of another alarm more than 75% of the time to be considered consequential. This report also allows you to exclude chattering alarms and alarms that occur less than a specified frequency.

In this Report, for particular Tagname & Alarmtype, we consider 1st occurrence of ALM time and then find out any other Tagname & Alarmtype came in +/- 15minutes then we consider it as 1 occurrence of that Tag. Likewise, it this sequence happens 5 or more time and also Percentage of occurrence >75% then we consider it as Consequential alarm.

Navigation: Report Menu -> Alarm system Performance -> Consequential Alarm

To analyze Consequential Alarm: Follow Steps as mention below to do Analysis with Consequential Alarm Report

1) Go to Reports Menu and select Alarm System Performance, in that select Consequential Alarm and click on it.
2) In the **Occurrences >** box, type the percent of time that the potential consequential alarm must occur in the specified time span relative to the source alarm event. Default value is 75%.
3) In the **Count** box, type the number of occurrences under which evaluated alarms will be excluded. Default value is 3.
4) Check the **Exclude chattering alarms** option to exclude chattering alarms from the analysis. By default exclude chatter is disable.
5) In **Duration** box, Enter the time span (in minutes) that alarms will be analyzed before and after the source alarm event. Default duration is 15 minutes.
6) Click on Refresh button from Operation Toolbar.



Detail Description of Analysis:

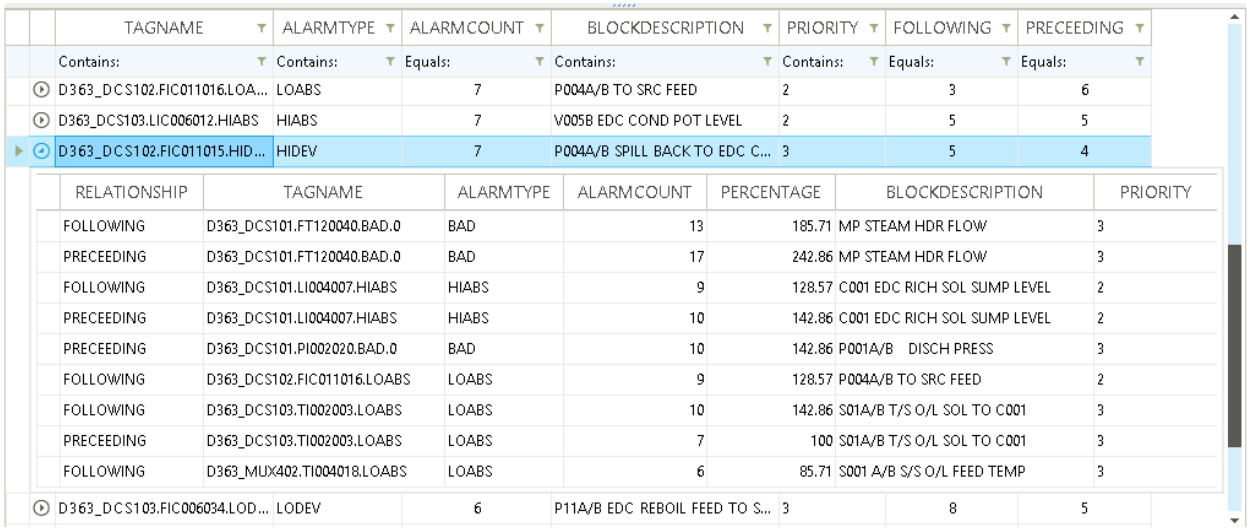
Tagname	This are the constraints of alarm Events Parameters for which chattering Cycle is occur
Alarmtype	
AlarmCount	Total alarm events occurrence count for the with respect to the Consequential alarm
BlockDescription	This are the constraints of alarm Events Parameters for which chattering Cycle is occur
Priority	
Following	Represent the count for the Combinations that became after the alarm event.
Preceeding	Represent the count for the Combinations that became before the alarm event.

The analysis results include the alarm Events Details for the Consequential Alarm Report. Alarm details will be expanded by clicking on Expand button at the right side of the report.

Consequential analysis also display details with below Details:

Relationship	Value in this field will be Following or Preceding with respect to the parent tag

Tagname	This are the constraints of alarm Events Parameters for which chattering Cycle is occur
Alarmtype	
AlarmCount	Sum of alarm occurrence for child tag with respect to the parent tag alarm and relationship.
Percentage	Alarm Occurrence in percentage
BlockDescription	This are the constraints of alarm Events Parameters for which chattering Cycle is occur
Priority	



TAGNAME	ALARMTYPE	ALARMCOUNT	BLOCKDESCRIPTION	PRIORITY	FOLLOWING	PRECEEDING
Contains:	Contains:	Equals:	Contains:	Contains:	Equals:	Equals:
D363_DCS102.FIC011016.LOA...	LOABS	7	P004A/B TO SRC FEED	2	3	6
D363_DCS103.LIC006012.HIABS	HIABS	7	V005B EDC COND POT LEVEL	2	5	5
D363_DCS102.FIC011015.HID...	HIDEV	7	P004A/B SPILL BACK TO EDC C...	3	5	4

RELATIONSHIP	TAGNAME	ALARMTYPE	ALARMCOUNT	PERCENTAGE	BLOCKDESCRIPTION	PRIORITY
FOLLOWING	D363_DCS101.FT120040.BAD.0	BAD	13	185.71	MP STEAM HDR FLOW	3
PRECEEDING	D363_DCS101.FT120040.BAD.0	BAD	17	242.86	MP STEAM HDR FLOW	3
FOLLOWING	D363_DCS101.LI004007.HIABS	HIABS	9	128.57	C001 EDC RICH SOL SUMP LEVEL	2
PRECEEDING	D363_DCS101.LI004007.HIABS	HIABS	10	142.86	C001 EDC RICH SOL SUMP LEVEL	2
PRECEEDING	D363_DCS101.PI002020.BAD.0	BAD	10	142.86	P001A/B DISCH PRESS	3
FOLLOWING	D363_DCS102.FIC011016.LOABS	LOABS	9	128.57	P004A/B TO SRC FEED	2
FOLLOWING	D363_DCS103.TI002003.LOABS	LOABS	10	142.86	S01A/B T/S O/L SOL TO C001	3
PRECEEDING	D363_DCS103.TI002003.LOABS	LOABS	7	100	S01A/B T/S O/L SOL TO C001	3
FOLLOWING	D363_MUX402.TI004018.LOABS	LOABS	6	85.71	S001 A/B S/S O/L FEED TEMP	3

D363_DCS103.FIC006034.LOD...	LODEV	6	P11A/B EDC REBOIL FEED TO S...	3	8	5

Duplicate Alarm Report

The **Duplicate Alarm** analysis identifies potentially redundant alarms, based on the alarm's context. The length of time to check before and after the alarm event occurs defines the criterion for duplicate alarms and is defined on the Duplicate tab of the Analysis Specific tab on the report.

Interconnections between points in DCS can create case of Duplicate alarm .as an example, a measurement may be sent from sensor point to a controller point, to a totalizer point, to a logic point and so forth. Often a "Bad measurement" alarm is configured on each point and thus if the sensor point goes into that condition, several simultaneous alarms will result. Duplicate alarms are the alarms that persistently occur within in short time period of Another Alarm.

The **Duplicate Report** allows the configuration of two criteria used in calculating which alarms should be considered as duplicate alarm. For example, you may want only alarms occurring within the +1 or - 1 sec of other alarm will be considered as duplicate alarms. This report also allows you to exclude chattering alarms.

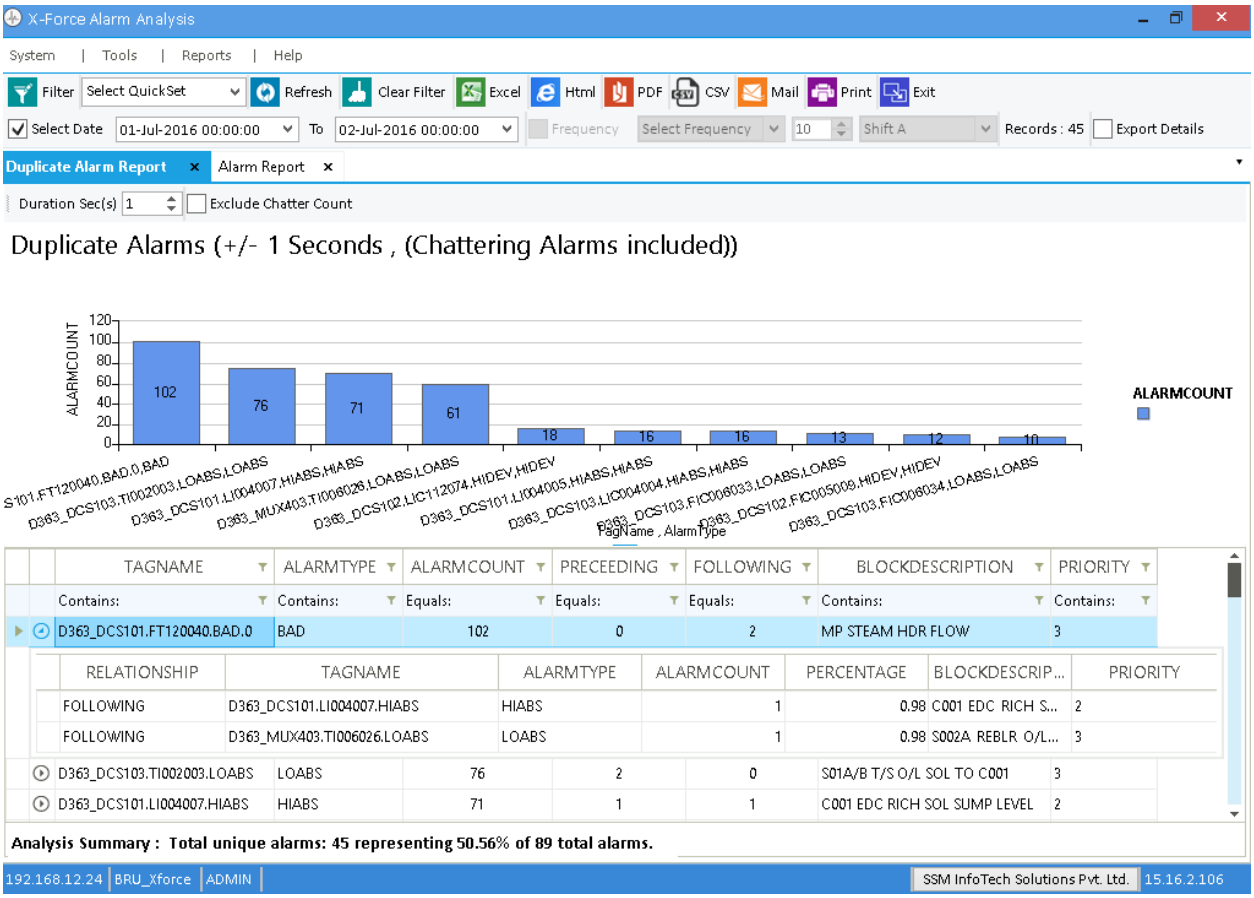
The **Duplicate** tab allows you to indicate the number of seconds apart that alarm events analyzed can occur in order to be considered duplicate alarms.

In this Report, for particular Tagname & Alarmtype, we consider 1st occurrence of ALM time and then find out any other Tagname & Alarmtype came in +/- 1 second then we consider it as 1 occurrence of that Tag and find out similar Sequence .then we consider it as Duplicate alarm.

Navigation: Report Menu -> Alarm system Performance -> Duplicate Alarm

To analyze Duplicate Alarm: Follow Steps as mention below to do Analysis with Duplicate Alarm Report

1) Go to Reports Menu and select Alarm System Performance, in that select Duplicate Alarm and click on it.
2) In **Duration** box, Enter the time span (in Sec) that alarms will be analyzed before and after the source alarm event. Default duration is 1 sec Click on Refresh button from Operation Toolbar.
3) Enable **Exclude Chatter count** if it is required to not consider repeating alarms (chatter alarms) in calculation of Duplicate alarm.
4) Click on Refresh button from Operation Toolbar.



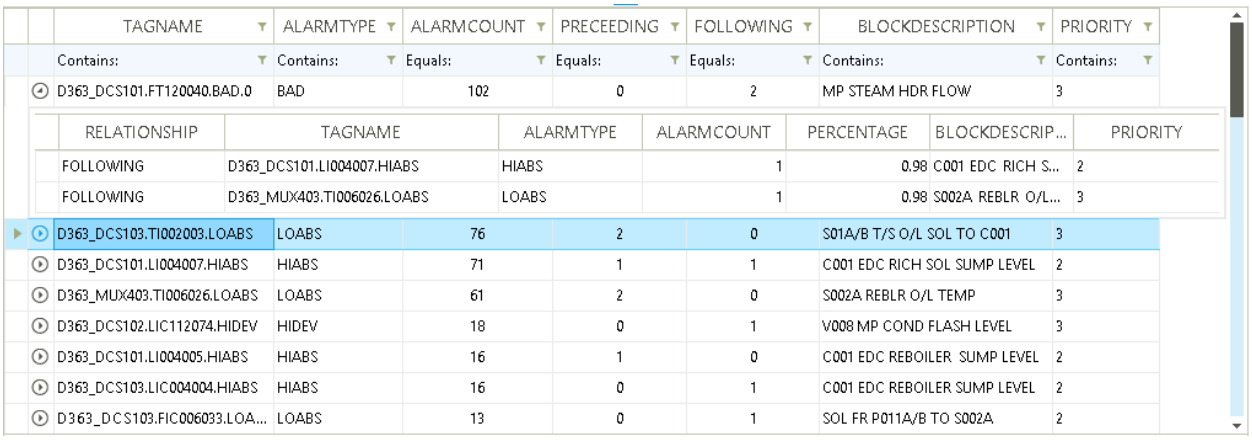
Detail Description of Analysis:

Tagname	This are the constraints of alarm Events Parameters for which chattering Cycle is occur
Alarmtype	
AlarmCount	Total alarm events occurrence count for the with respect to the Consequential alarm
Following	Represent the count for the Combinations that became after the alarm event.
Preceeding	Represent the count for the Combinations that became before the alarm event.
BlockDescription	This are the constraints of alarm Events Parameters for which chattering Cycle is occur
Priority	

The analysis results include the alarm Events Details for the Duplicate Alarm Report. Alarm details will be expanded by clicking on Expand button at the right side of the report.

The details will represent the Relationship in context with the parent tag and also display its occurrences. It represent details of alarm with its relationship with respect to the parent alarm which causes other alarm events to occur.

Duplicate analysis also display details with below Details:



TAGNAME	ALARMTYPE	ALARMCOUNT	PRECEEDING	FOLLOWING	BLOCKDESCRIPTION	PRIORITY
Contains:	Contains:	Equals:	Equals:	Equals:	Contains:	Contains:
D363_DCS101.FT120040.BAD.0	BAD	102	0	2	MP STEAM HDR FLOW	3

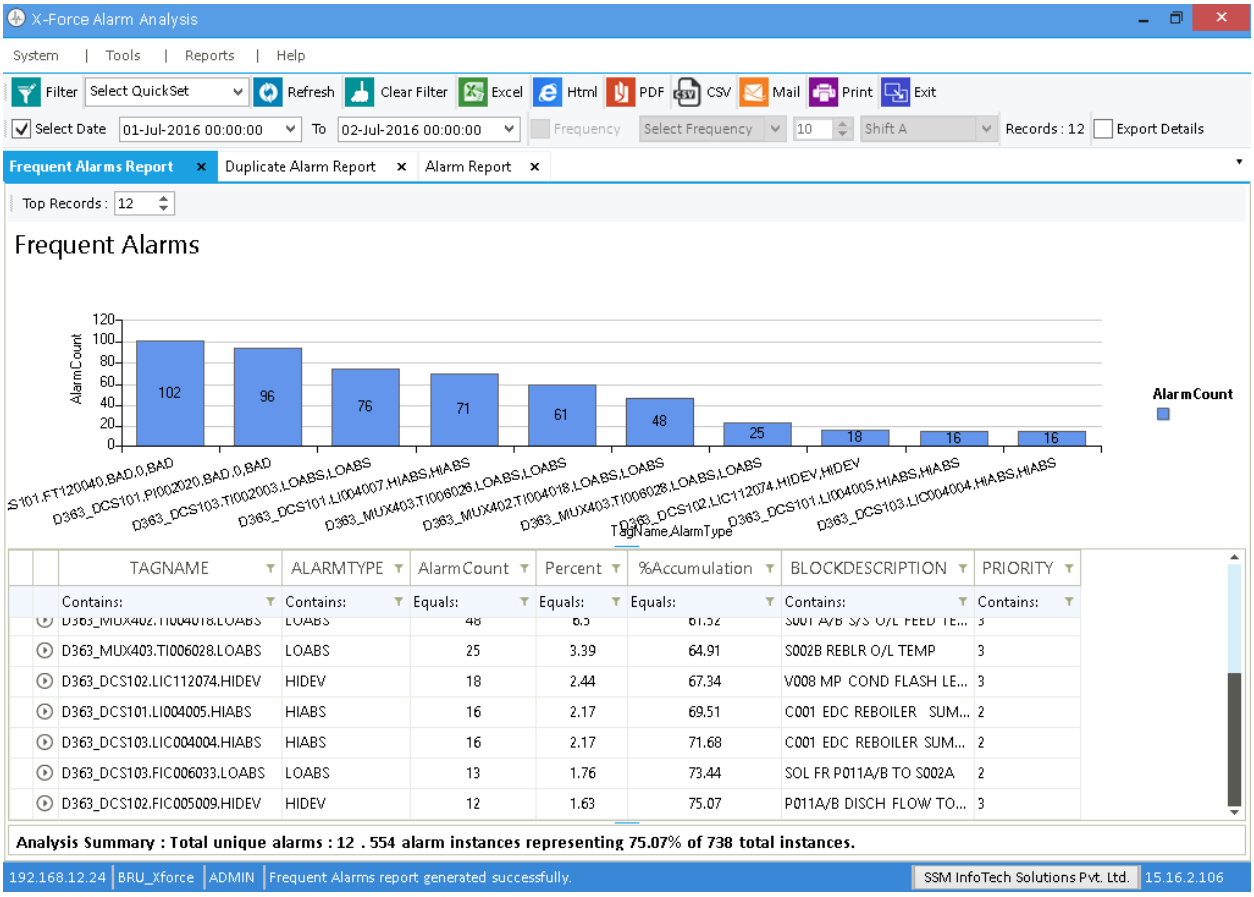
RELATIONSHIP	TAGNAME	ALARMTYPE	ALARMCOUNT	PERCENTAGE	BLOCKDESCRIP...	PRIORITY
FOLLOWING	D363_DCS101.LI004007.HIABS	HIABS	1	0.98	C001 EDC RICH S...	2
FOLLOWING	D363_MUX403.TI006026.LOABS	LOABS	1	0.98	S002A REBLR O/L...	3

D363_DCS103.TI002003.LOABS	LOABS	76	2	0	S01A/B T/S O/L SOL TO C001	3
D363_DCS101.LI004007.HIABS	HIABS	71	1	1	C001 EDC RICH SOL SUMP LEVEL	2
D363_MUX403.TI006026.LOABS	LOABS	61	2	0	S002A REBLR O/L TEMP	3
D363_DCS102.LIC112074.HIDEV	HIDEV	18	0	1	V008 MP COND FLASH LEVEL	3
D363_DCS101.LI004005.HIABS	HIABS	16	1	0	C001 EDC REBOILER SUMP LEVEL	2
D363_DCS103.LIC004004.HIABS	HIABS	16	0	1	C001 EDC REBOILER SUMP LEVEL	2
D363_DCS103.FIC006033.LOA...	LOABS	13	0	1	SOL FR P011A/B TO S002A	2

Relationship	Value in this field will be Following or Preceding with respect to the parent tag
Tagname	This are the constraints of alarm Events Parameters for which chattering Cycle is occur
Alarmtype	
AlarmCount	Sum of alarm occurrence for child tag with respect to the parent tag alarm and relationship.
Percentage	Alarm Occurrence in percentage
BlockDescription	This are the constraints of alarm Events Parameters for which chattering Cycle is occur
Priority	

Frequent Alarm

The **Frequent Alarm** analysis reveals important trends in alarm activity by displaying the number of times an alarm event occurred during the given time period. For example, an alarm may go into an alarm state several times during the day. The Frequent Alarm tab provides a mechanism to select top alarm activity.



Frequent alarms are alarms that occur most recurrently across the systems being monitored

The analysis results include a list of entities, and for each entity, the associated alarm parameter, number of alarm events, the percentage of total alarm events, and the entity point description. The analysis also displays the total number of alarm events and the total number of unique alarm events.

Navigation: Report Menu -> Alarm system Performance -> Frequent Alarm

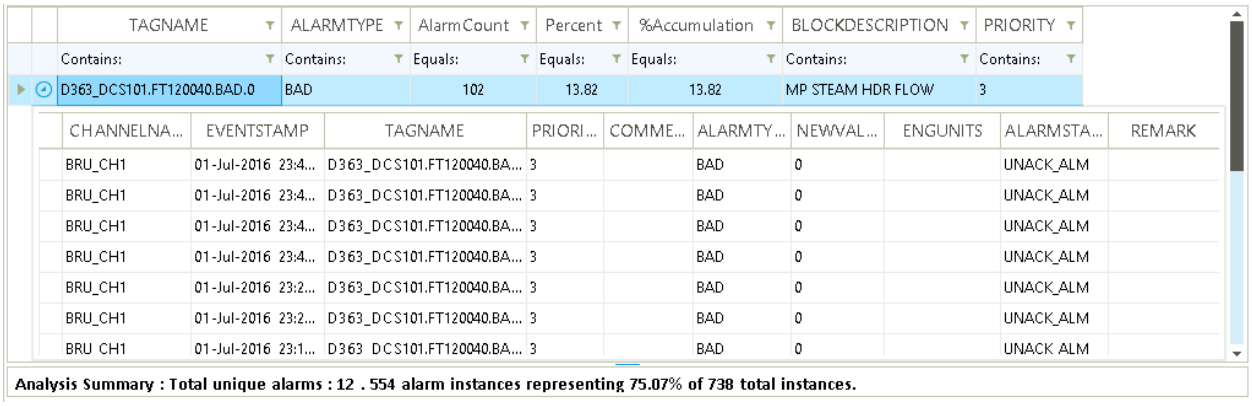
To analyze Frequent Alarm: Follow Steps as mention below to do Analysis with Frequent Alarm Report

1) Go to Reports Menu and select Alarm System Performance, in that select Duplicate Alarm and click on it.
2) In **Top Records** box, Enter the count that no of Data will be analyzed for Frequent alarm Report
3) Click on Refresh button from Operation Toolbar.

Detail Description of Analysis:

Tagname	This are the constraints of alarm Events Parameters for which chattering Cycle is occur
Alarmtype	
AlarmCount	Total alarm events occurrence for the with respect to the Consequential alarm
Following	Represent the count for the Combinations that became after the alarm event.
%Accumulation	
BlockDescription	This are the constraints of alarm Events Parameters for which chattering Cycle is occur
Priority	

Frequent Alarm analysis also display details with below in child data:



TAGNAME	ALARMTYPE	AlarmCount	Percent	%Accumulation	BLOCKDESCRIPTION	PRIORITY
Contains:	Contains:	Equals:	Equals:	Equals:	Contains:	Contains:
D363_DCS101.FT120040.BAD.0	BAD	102	13.82	13.82	MP STEAM HDR FLOW	3

CHANNELNA...	EVENTSTAMP	TAGNAME	PRIORI...	COMME...	ALARMTY...	NEWVAL...	ENGUNITS	ALARMSTA...	REMARK
BRU_CH1	01-Jul-2016 23:4...	D363_DCS101.FT120040.BA...	3		BAD	0		UNACK_ALM	
BRU_CH1	01-Jul-2016 23:4...	D363_DCS101.FT120040.BA...	3		BAD	0		UNACK_ALM	
BRU_CH1	01-Jul-2016 23:4...	D363_DCS101.FT120040.BA...	3		BAD	0		UNACK_ALM	
BRU_CH1	01-Jul-2016 23:4...	D363_DCS101.FT120040.BA...	3		BAD	0		UNACK_ALM	
BRU_CH1	01-Jul-2016 23:2...	D363_DCS101.FT120040.BA...	3		BAD	0		UNACK_ALM	
BRU_CH1	01-Jul-2016 23:2...	D363_DCS101.FT120040.BA...	3		BAD	0		UNACK_ALM	
BRU_CH1	01-Jul-2016 23:1...	D363_DCS101.FT120040.BA...	3		BAD	0		UNACK_ALM	

Analysis Summary : Total unique alarms : 12 . 554 alarm instances representing 75.07% of 738 total instances.

Priority Distribution

The **Priority Distribution** analysis identifies the number of alarms by priority.it will also display tagname, msgtype, Alarm type, channel name wise no of alarms for each of the configured priority etc. it will display hourly and monthly no of alarms with respect to the selected eventstamp for priority. This report will also display count in % also.

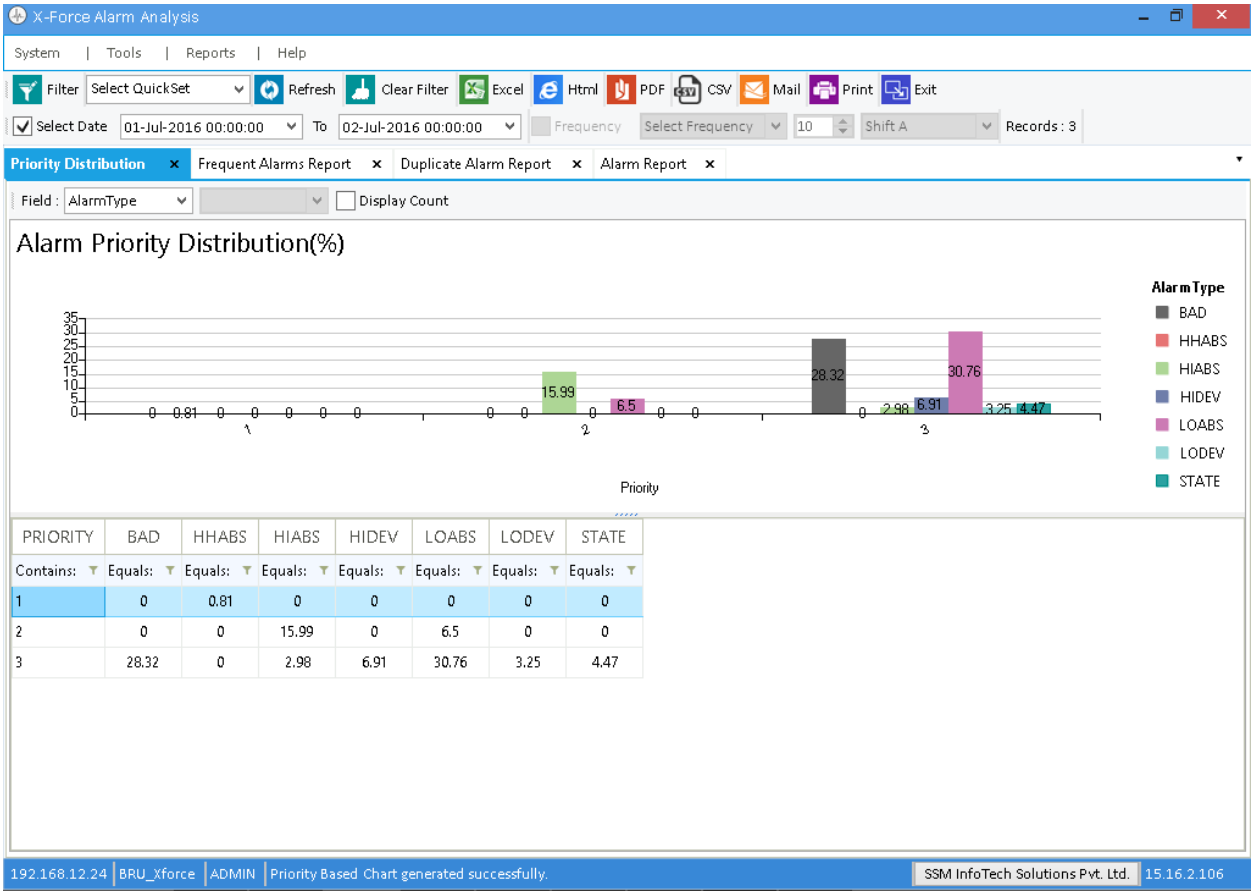
Navigation: Report Menu -> Alarm system Performance -> Priority Distribution

To analyze Priority Distribution Report: Follow Steps as mention below to do Analysis with Priority Distribution Report

1) Go to Reports Menu and select Alarm System Performance, in that select Priority Distribution and click on it.
2) In **Field** box, select any of the field .you can do analysis with below listed fields
   - Msgtype
   - Alarm type
   - Priority

- Tagname
- Channel name
- Eventstamp

3) Enable **Display count** will display no of alarms in number format otherwise by default it will display count in %.
4) Click on Refresh button in operation toolbar.



Stale Alarm

The **Stale Alarm** analysis displays entities that have been in an alarm state for an extended period of time (e.g., longer than a shift) without returning to the normal state. The stale alarm configuration defines the period of time that an entity has to be in an alarm state to qualify as stale.

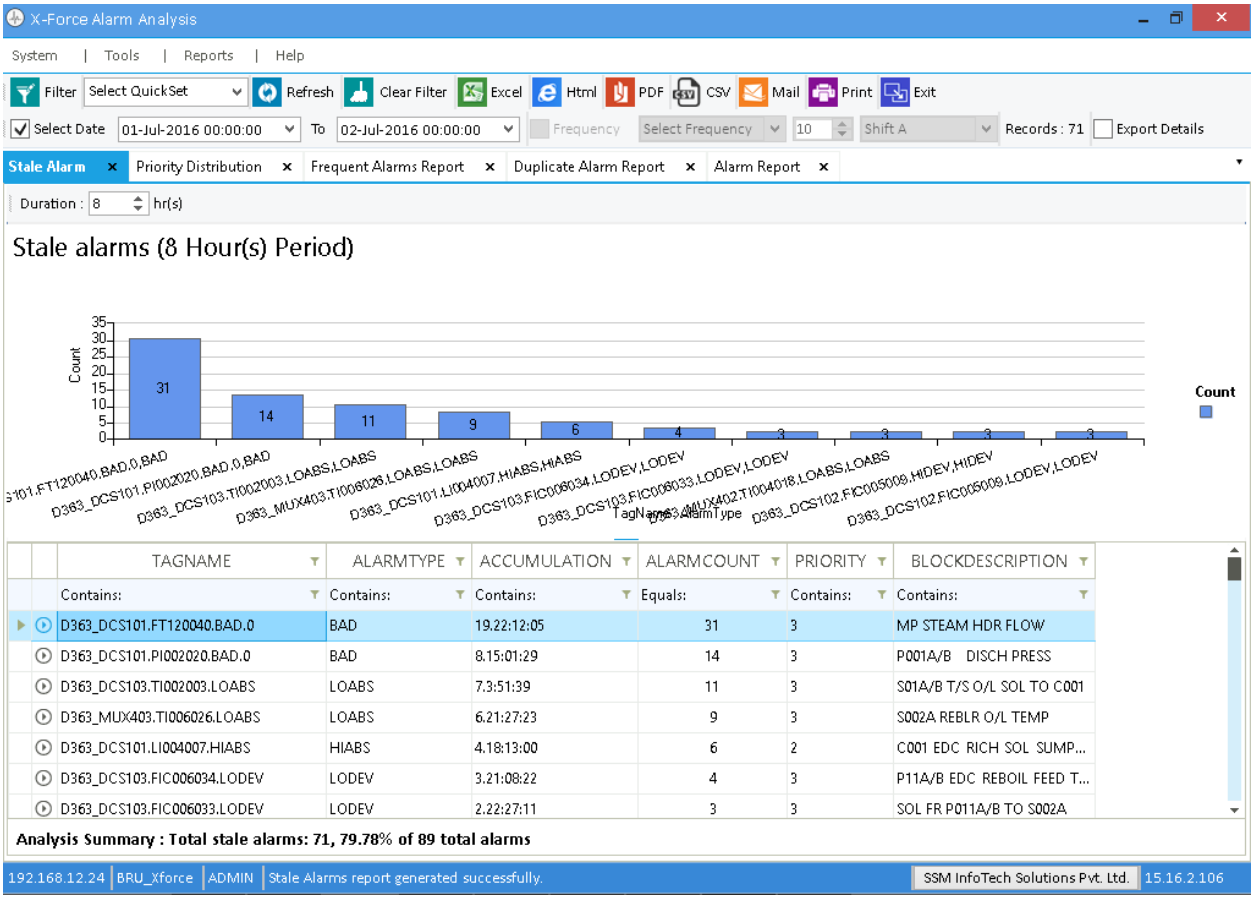
The Stale tab provides a mechanism to define the length of time that an alarm must have remained in an alarm state in order to be considered stale.

In this Report, for particular Tagname & Alarmtype, we consider 1st occurrence of ALM time and then find out the return time for the same tag name and alarm type and if alarm to return time is exceed to specified limit (default is 8) then we consider Stale alarm.

Navigation: Report Menu -> Alarm system Performance -> Stale alarm

To analyze Priority Distribution Report: Follow Steps as mention below to do Analysis with Stale Alarm Report

1) Go to Reports Menu and select Alarm System Performance, in that select Stale Alarm and click on it.
2) In **Duration** box, enter the no of hours for stale alarm.
3) Click on Refresh button from Operation Toolbar.

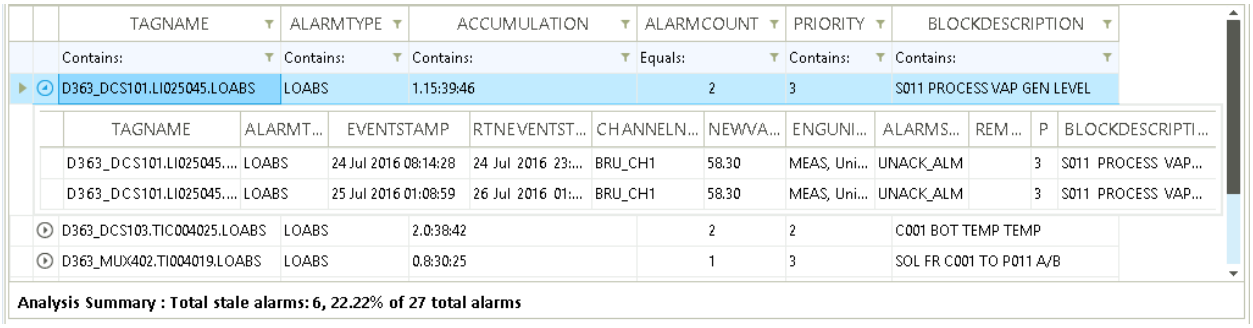


Detail Description of Analysis:

Tagname	This are the Parameters of alarm Events for stale alarm
Alarmtype	
Accumulation	Accumulation represent total time duration from Alarm event time to Alarm Return event time

Alarm count	Sum of all alarm event which has more than 8 hours duration between its alarms events and return event occurrence.
Priority	This are the Parameters of alarm Events for stale alarm
BlockDescription	

Stale Alarm analysis also display details with below in child data:



TAGNAME	ALARMTYPE	ACCUMULATION	ALARMCOUNT	PRIORITY	BLOCKDESCRIPTION
Contains:	Contains:	Contains:	Equals:	Contains:	Contains:
D363_DCS101.LI025045.LOABS	LOABS	1.15:39:46	2	3	S011 PROCESS VAP GEN LEVEL

TAGNAME	ALARMT...	EVENTSTAMP	RTNEVENTST...	CHANNELN...	NEWVA...	ENGUNI...	ALARMS...	REM...	P	BLOCKDESCRIPTI...
D363_DCS101.LI025045....	LOABS	24 Jul 2016 08:14:28	24 Jul 2016 23:...	BRU_CH1	58.30	MEAS, Uni...	UNACK_ALM		3	S011 PROCESS VAP...
D363_DCS101.LI025045....	LOABS	25 Jul 2016 01:08:59	26 Jul 2016 01:...	BRU_CH1	58.30	MEAS, Uni...	UNACK_ALM		3	S011 PROCESS VAP...

D363_DCS103.TIC004025.LOABS	LOABS	2.0:38:42	2	2	C001 BOT TEMP TEMP
D363_MUX402.TI004019.LOABS	LOABS	0.8:30:25	1	3	SOL FR C001 TO P011 A/B

Analysis Summary : Total stale alarms: 6, 22.22% of 27 total alarms

Tagname	This are the Parameters of alarm Events for which stale Alarm
Alarmtype	
Eventstamp	Time of alarm event of particular tag
RTNEventstamp	Time of return event of particular tag
ChannelName , Newvalue,ENGUNITS, remarks, BlockDescription	This are the Parameters of alarm Events for which stale Alarm

Note: The Honeywell DCS may not capture all RETURN-TO-NORMAL events and the Stale Alarm analysis is therefore not 100 percent accurate. This analysis is good for identifying long duration alarms even if the exact count or duration is slightly off.

Time in Alarm

The **Time in Alarm** analysis documents the length of time an entity spends in an alarm state before returning to its normal state. This analysis is not the same as the Time to Acknowledge analysis because an alarm event may return to its normal state without the operator's acknowledgement.

In this Report, it displays total ALM & RTN Alarms Paring details for particular TAGNAME & ALARMTYPE.

Navigation: Report Menu -> Alarm system Performance -> Time in Alarm

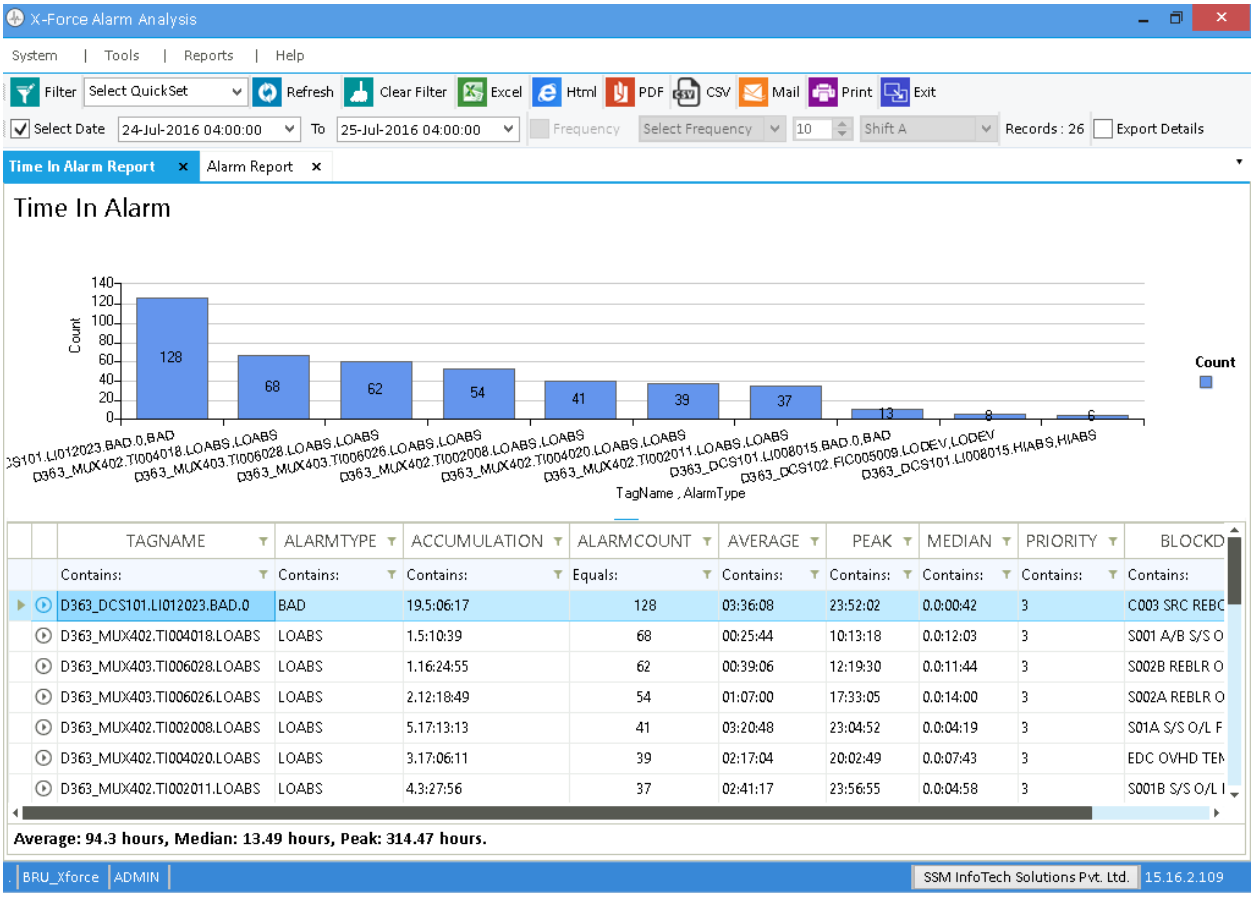
To analyze Time in Alarm Report: Follow Steps as mention below to do Analysis with Time in Alarm Report

1) Go to Reports Menu and select Alarm System Performance, in that select Time in Alarm and click on it.

2) Click on Refresh button from Operation Toolbar.

The analysis results include a list of entities, and for each entity, the associated alarm parameter, accumulated time in alarm, number of alarm events, average time in alarm per alarm event, and the entity point description. The analysis also displays the total number of alarm events and the total number of unique alarm events.

Time in alarm Report just represent Alarm to Return Data.



Detail Description of Analysis:

Tagname	This are the Parameters of alarm Events for stale alarm
Alarmtype	
Accumulation	Accumulation represent total time duration from Alarm event time to Alarm Return event time
Alarm count	Sum of all alarm to return event occurrence
Average	Average of total time duration for alarm to return event for particular tag.
Peak	Highest value of time difference for alarm to return event for particular tag.
Median	Median of total time duration for alarm to return event.

Priority BlockDescription	This are the Parameters of alarm Events for stale alarm

Time in Alarm also display detailed analysis of alarm events Alarm time and return event time for the specific

TAGNAME	ALARMTYPE	ACCUMULATION	ALARMCOUNT	AVERAGE	PEAK	MEDIAN	PRIORITY	BLOCKDESCRIPTION
Contains:	Contains:	Contains:	Equals:	Contains:	Contains:	Contains:	Contains:	Contains:
D363_DCS101....	HIABS	0.0:39:39	19	00:02:05	00:05:38	0.0:01:37	2	C001 EDC RICH SOL SUM...

EVENTSTAMP	RTNEVENTSTAMP
2016-08-05 06:07:54	2016-08-05 06:13:32
2016-08-05 06:17:12	2016-08-05 06:20:04
2016-08-05 06:21:06	2016-08-05 06:21:21
2016-08-05 06:22:58	2016-08-05 06:27:38
2016-08-05 06:34:43	2016-08-05 06:35:53

tag as mention below :

Time in Alarm Analysis also provide summary of the report as display in below image.

Average: 51.74 hours, Median: 8.48 hours, Peak: 58.31 hours.

In above Summary line

Average: 51.74 hours is the average time duration in hour from Alarm to return event occurrence for any tag.

Median: 8.48 hours is the median value in hours.

Peak: 58.31 hours is the highest value of Alarm to return event time duration.

Note: if ALM event is not occur during the Report generation time Duration than Report start time is consider as Alarm Event occurrence time. Same as RTN Event is not occur during the report generation duration , report End time will be consider as Return event time and other calculation are done as per the duration.

Time to Ack

The **Time to Acknowledge** analysis indicates the average operator response time to alarm events. This analysis is not the same as the Time in Alarm analysis because an alarm event may return to its normal state without the operator's acknowledgement.

In this Report, it displays total ALM & ACK Alarms Paring details for particular TAGNAME & ALARMTYPE.

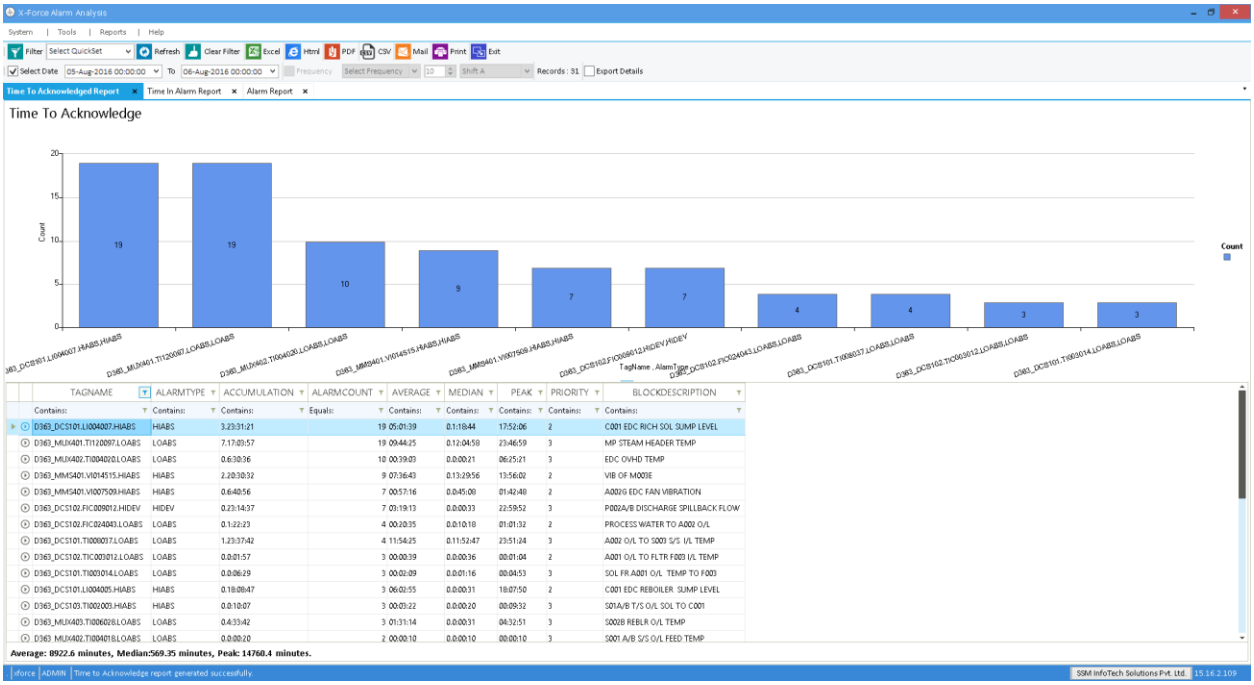
Navigation: Report Menu -> Alarm system Performance -> Time to ACK

To analyze Time to Ack Report: Follow Steps as mention below to do Analysis with Time to Ack Report

1) Go to Reports Menu and select Alarm System Performance, in that select Time to Ack and click on it.
2) Click on Refresh button from Operation Toolbar.

The analysis results include a list of entities, and for each entity, the associated alarm parameter, accumulated time to acknowledge, number of alarm events, average time to acknowledge per alarm event. The analysis also displays the total number of alarm events and the total number of unique alarm events.

Time to Ack Report just describes all Alarm to Acknowledge Data with all alarm parameters in given time Duration.



Note: This analysis is not available for all systems. This report is only available for the DCS which will provide Acknowledgement Data.

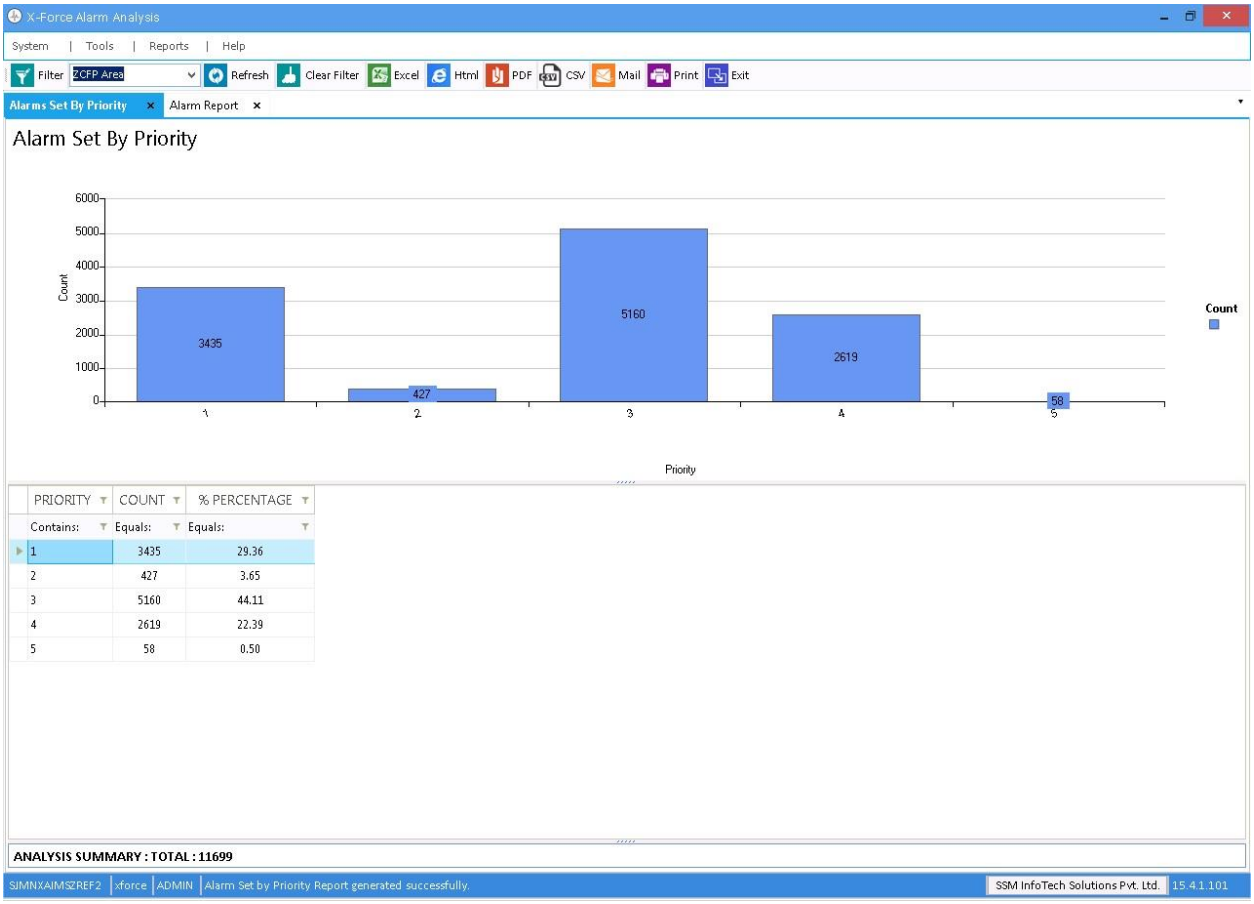
Alarm System Settings

Alarms set by Priority

The **Alarms Set by Priority** analysis is a breakdown of the number of configured alarms grouped by alarm priorities as defined by the control system manufacturer.

The results of this analysis can be used to determine whether the control system priority settings are within EEMUA 191 metrics, which is beneficial for providing a snapshot of the alarm system settings. It can also be used to help determine the effectiveness of the alarm prioritization scheme.

Navigation: Report Menu -> Alarm system Settings -> Alarms Set by Priority



To analyze Alarm Set by Priority Report: Follow Steps as mention below to do Analysis with Time to Ack Report

1) Go to Reports Menu and select Alarm System Settings, in that select Alarms Set by Priority and click on it.
2) Click on Refresh button from Operation Toolbar.

Alarms set by Type

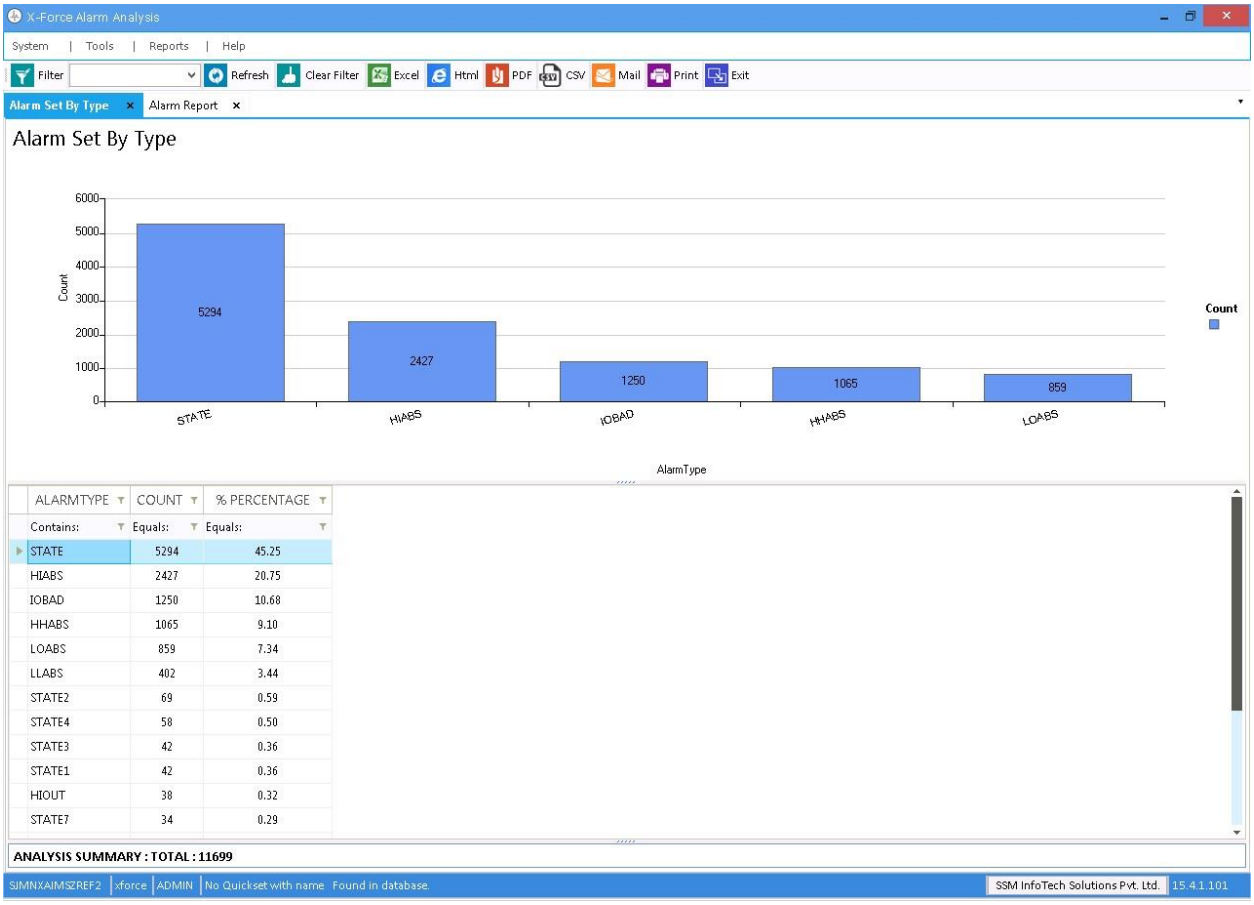
The **Alarms Set by Type** analysis is a breakdown of the number of configured alarms grouped by the specific alarm types as defined by the control system manufacturer.

The results of this analysis can help you gain insight as to the current configuration of the control system, which is useful for showing the following:

- Non-standard alarm types
- Alarms that are configured outside of "best practices" (such as the use of Off Normal rather than Change of State)

- Alarm that may be configured outside the guidelines defined within the alarm philosophy (such as High High and Low Low)

Navigation: Report Menu -> Alarm system Settings -> Alarms Set by Type



To analyze Alarms Set By Type Report: Follow Steps as mention below to do Analysis with Alarms Set by Type

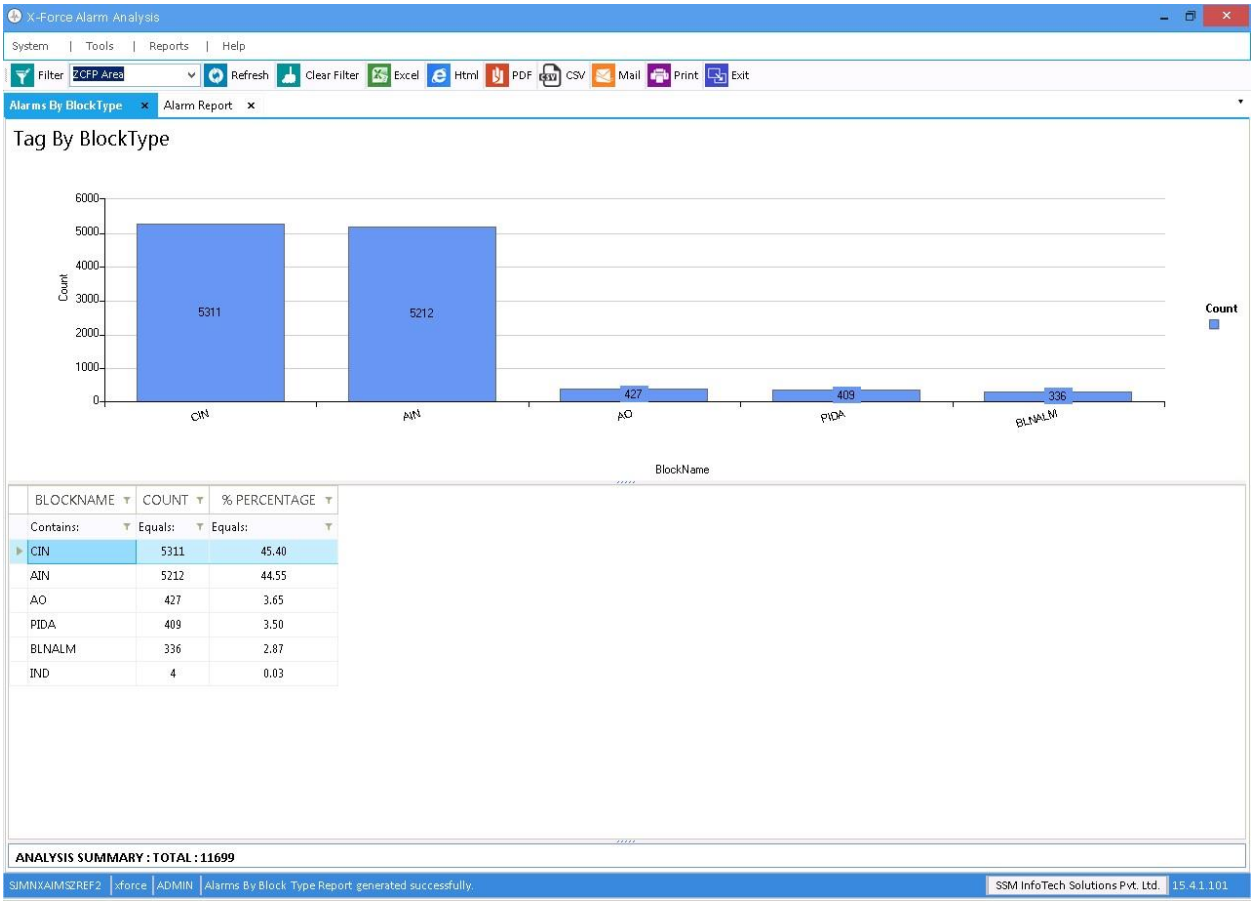
1) Go to Reports Menu and select Alarm System Settings, in that select Alarms Set by Type Report and click on it.
2) Click on Refresh button from Operation Toolbar.

Alarms Tag by Type

The **Tags by Type** analysis is a breakdown of the configured tags grouped by specific tag types as defined by the control system manufacturer.

This analysis shows the breakdown of the number of tag types configured in the control system, which can be used to document items such as count of tags connected to field instrumentation.

Navigation: Report Menu -> Alarm system Settings -> Alarms Tag by Type



To analyze Alarms Tag by Type Report: Follow Steps as mention below to do Analysis with Alarms Tag by Type

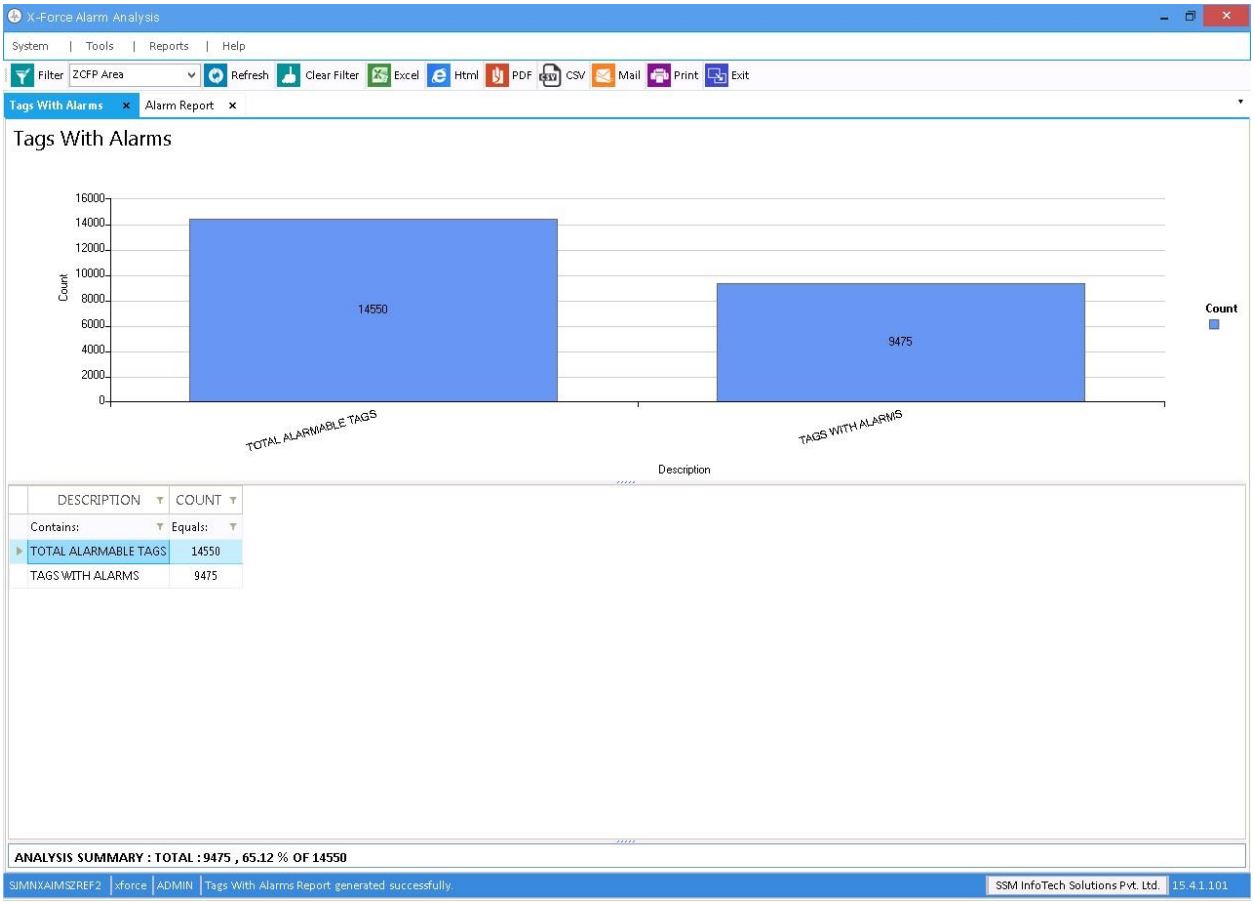
1) Go to Reports Menu and select Alarm System Settings, in that select Alarms Tag by Type Report and click on it.
2) Click on Refresh button from Operation Toolbar.

Tags with Alarms

The **Tags with Alarms** analysis is a breakdown of the number of tags with configured alarms versus the number of tags that could have configured alarms within the control system.

The results of this analysis can be used to define over usage of an alarm system. Over-alarming can have a negative effect on the alarm system performance by overwhelming the operator and causing increased traffic on the control system network.

Navigation: Report Menu -> Alarm system Settings -> Tags with Alarms



To analyze Tags with Alarms Report**:** Follow Steps as mention below to do Analysis with Tags with Alarms

1) Go to Reports Menu and select Alarm System Settings, in that select Tags with Alarms Report and click on it.
2) Click on Refresh button from Operation Toolbar.

Process changes Reports

Alarm Priority Changes

The **Alarm Priorities** analysis summarizes changes made to the process value placed on alarm events. The analysis results include a list of entities, and for each entity, the alarm priority that changed, the number of times the priority changed, and the entity point description. The analysis also displays the total number of priority changes and the total number of unique entities with priority changes. From-value/to-value information is also available.

Navigation: Report Menu -> Process Changes -> Alarm Priority Changes

To analyze Alarm Priority changes Report: Follow Steps as mention below to do Analysis with Alarm Priority Changes

1) Go to Reports Menu and select Process Changes, in that select Alarm Priority Changes Report and click on it.
2) Click on Refresh button from Operation Toolbar.

Alarm Trip Points

The **Alarm Trip Points** analysis displays changes made to the value of analog trip point settings.

The analysis results include a list of entities, and for each entity, the alarm trip point that changed, the number of times the trip-point changed, and the entity point description. The analysis also displays the total number of trip point changes and the total number of unique entities with trip point changes. From-value/to-value information is also available.

Navigation: Report Menu -> Process Changes -> Alarm Trip Points

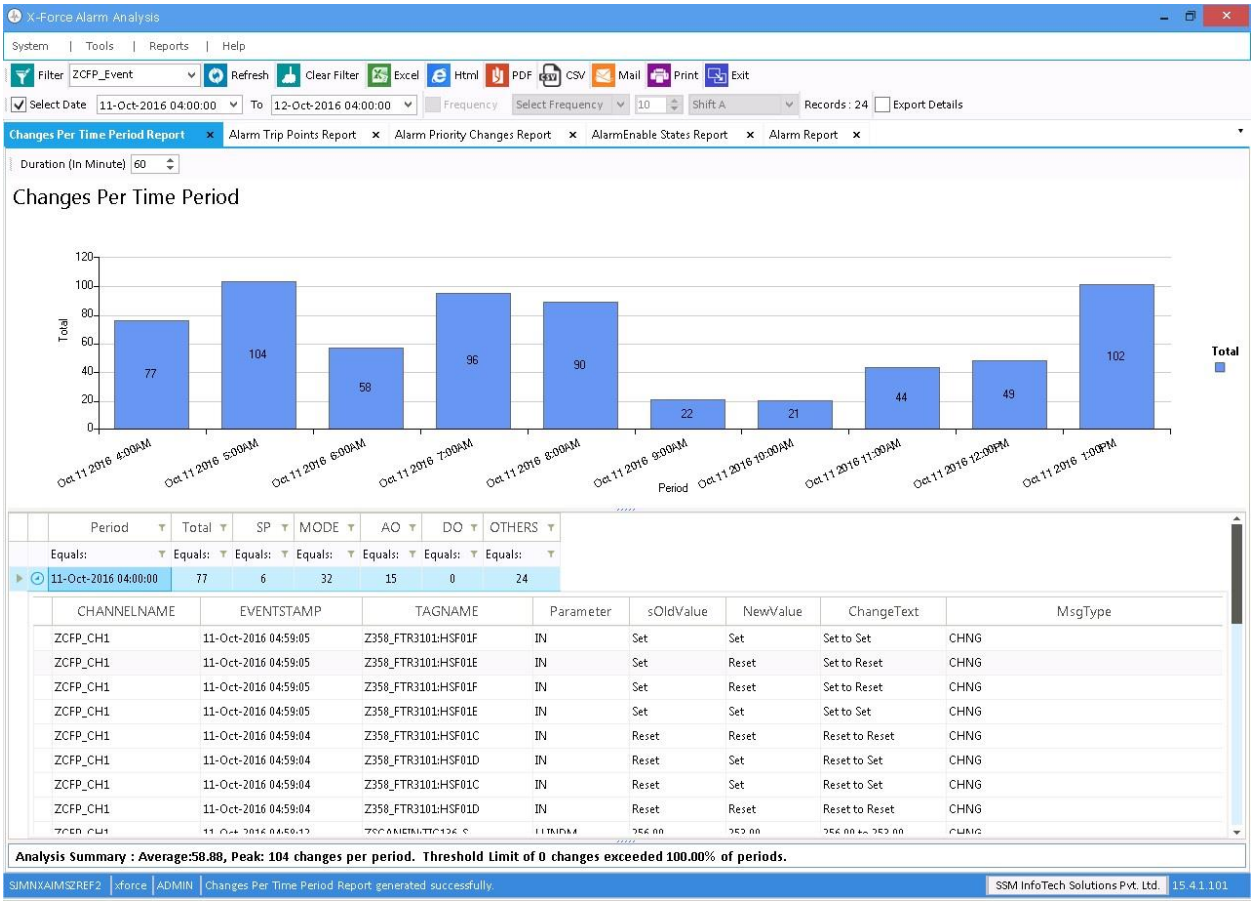
To analyze Alarm Priority changes Report: Follow Steps as mention below to do Analysis with Alarm Trip Points

1) Go to Reports Menu and select Process Changes, in that select Alarm Trip Points Report and click on it.
2) Click on Refresh button from Operation Toolbar.

Changes per Time Period

The **Changes per Time Period** analysis indicates the number of process changes during a predefined time period.

Navigation: Report Menu -> Process Changes -> Changes per Time Period



To analyze Changes per Time Period Report: Follow Steps as mention below to do Analysis with Changes per Time Period Report

1) Go to Reports Menu and select Process Changes, in that select Changes per Time Period and click on it.
2) From the Time boxes, select the increment value and corresponding time unit (e.g., 1 Hour, 30 minutes, etc.
3) Click on Refresh button from Operation Toolbar.

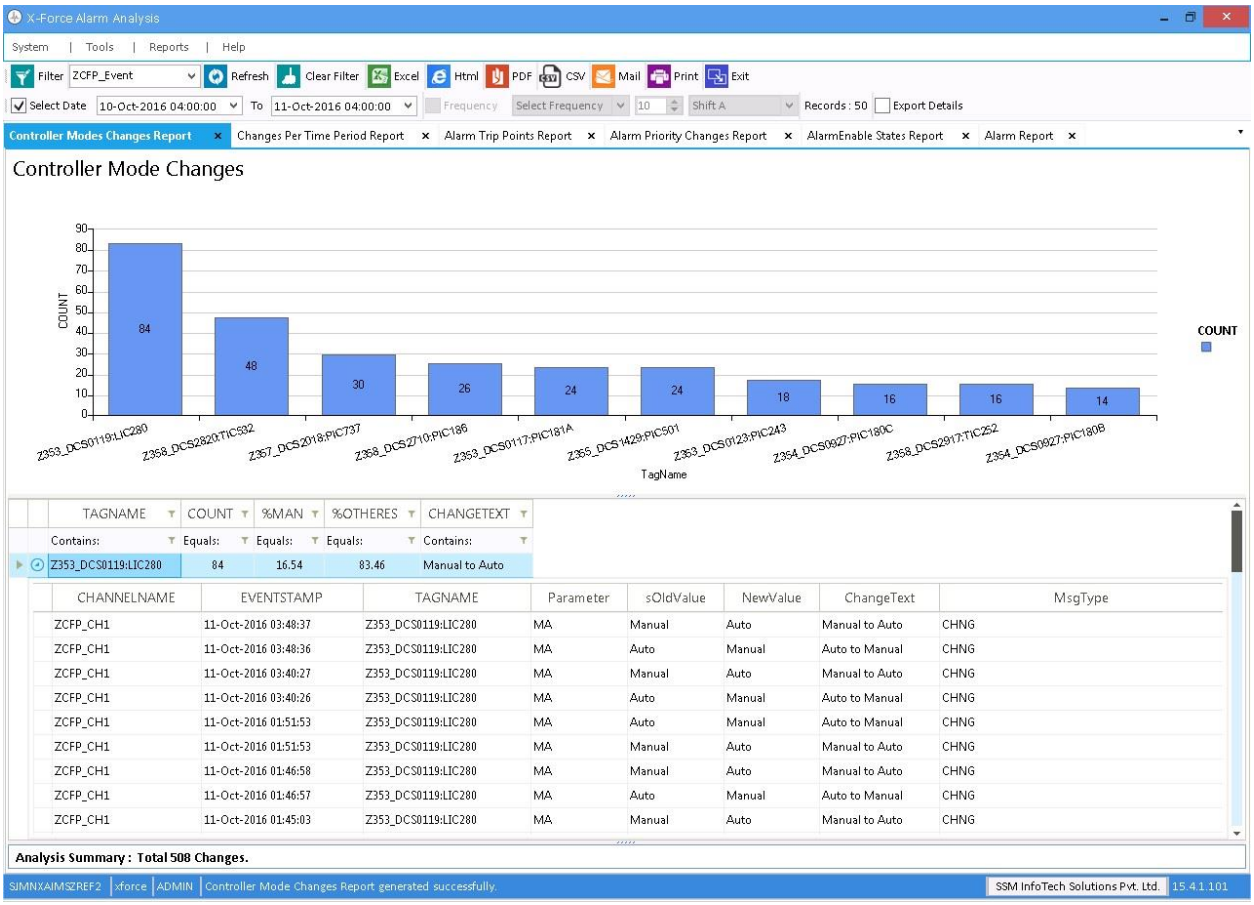
When running the **Changes per Time Period** analysis, the percent of the time that the threshold limit was exceeded is displayed at the bottom of the analysis. For example, if the threshold limit is 10, the time increment is 1 Hour, and the analysis is run for 1 Day, the Changes per Time Period analysis will display what percent of the 24 periods analyzed had more than ten changes within one hour.

Controller Modes Changes

The **Controller Modes** analysis indicates the amount of time that entities with journal mode changes spend in the journal mode(s).

The analysis results include a list of entities, and for each entity, its normal mode, number of mode changes, accumulated time in normal mode, percentages of time in the various modes (normal, manual and others), and the entity point description. The analysis also displays the total number of mode changes and the total number of unique entities with mode changes. From-value/to-value information is also available.

Navigation: Report Menu -> Process Changes -> Controller Mode Changes



To analyze Controller Modes Changes Report: Follow Steps as mention below to do Analysis with Controller Mode Changes Report

1) Go to Reports Menu and select Process Changes, in that select Controller Mode Changes and click on it.
2) Click on Refresh button from Operation Toolbar.

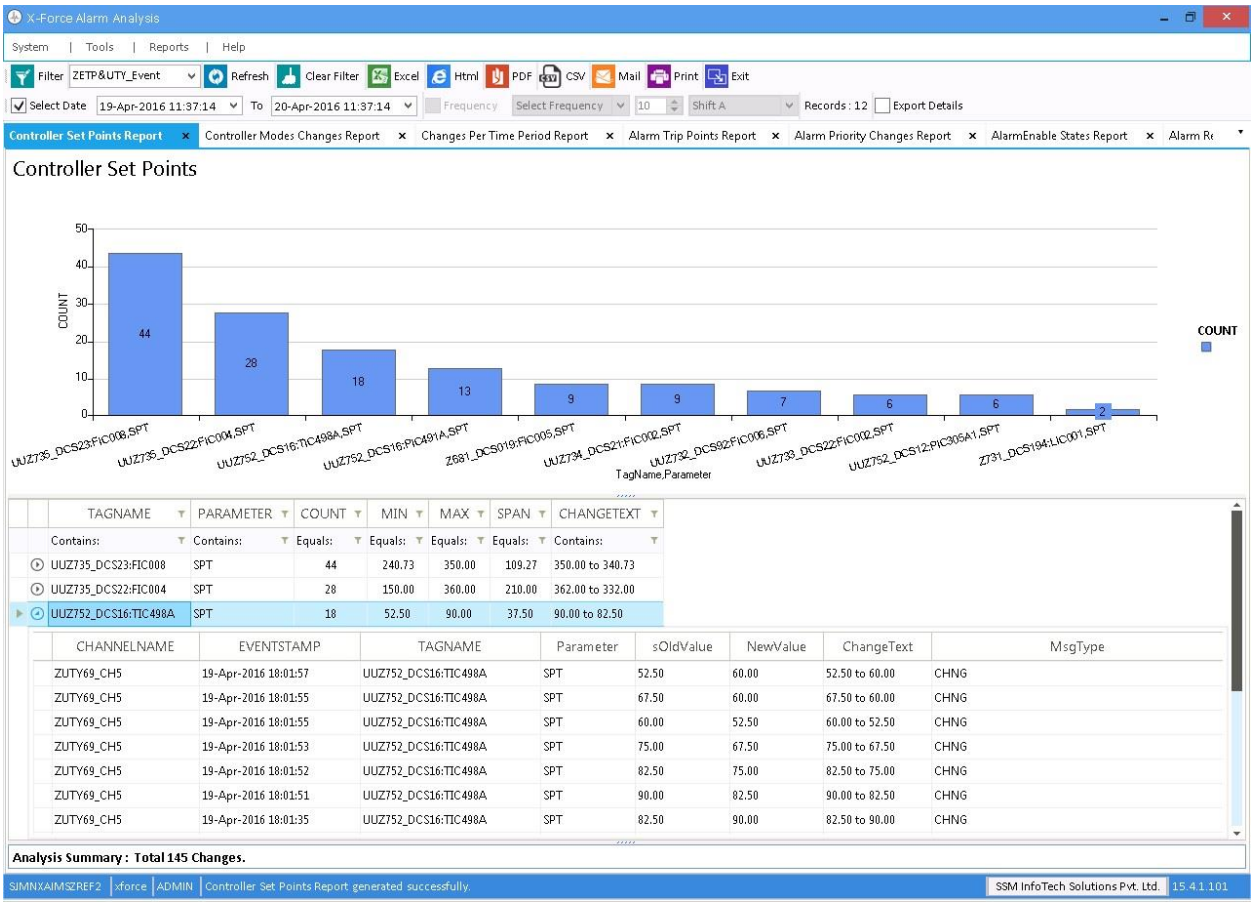
Controller set points Changes

Set point variability can have a significant impact on the desirable alarm trip-point settings for a specific entity. In cases where a set point varies across a wide range, it can be difficult to properly set the alarm trip points.

The Controller Set points analysis reveals these variability's, providing information valuable for evaluating current alarm trip point effectiveness, as well as developing more effective trip point settings as necessary.

The analysis results include a list of entities, and for each entity, the set point minimum, maximum and span, number of set point changes, and the entity point description. The analysis also displays the total number of set point changes and the total number of unique entities with set point changes. From-value/to-value information is also available.

Navigation: Report Menu -> Process Changes -> Controller Set Points



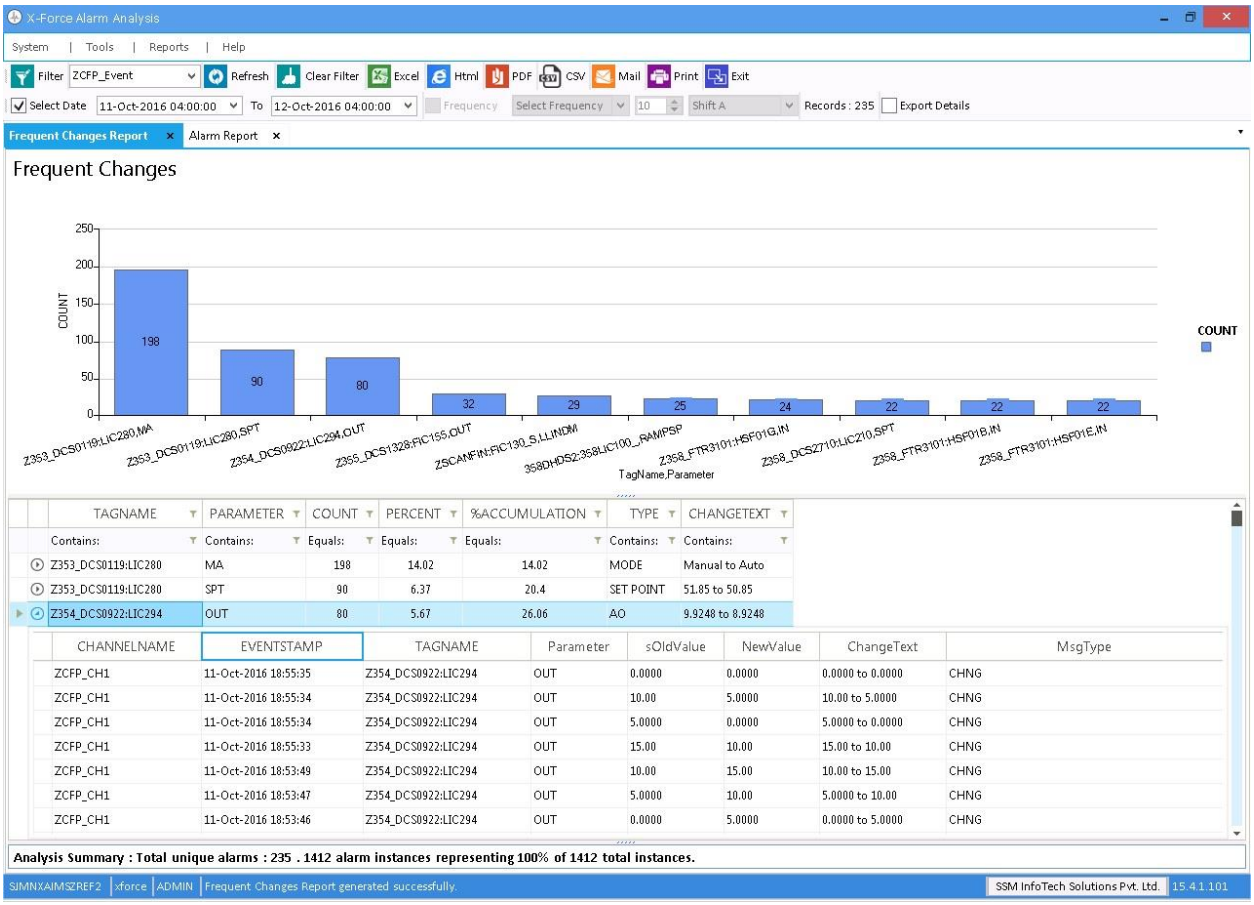
To analyze Controller Set Points Changes Report: Follow Steps as mention below to do Analysis with Controller Set Point Changes Report

1) Go to Reports Menu and select Process Changes, in that select Controller set point Changes and click on it.
2) Click on Refresh button from Operation Toolbar.

Frequent Changes

The **Frequent Changes** analysis displays all changes made by the operator sorted by the most frequent.

Navigation: Report Menu -> Process Changes -> Frequent Changes



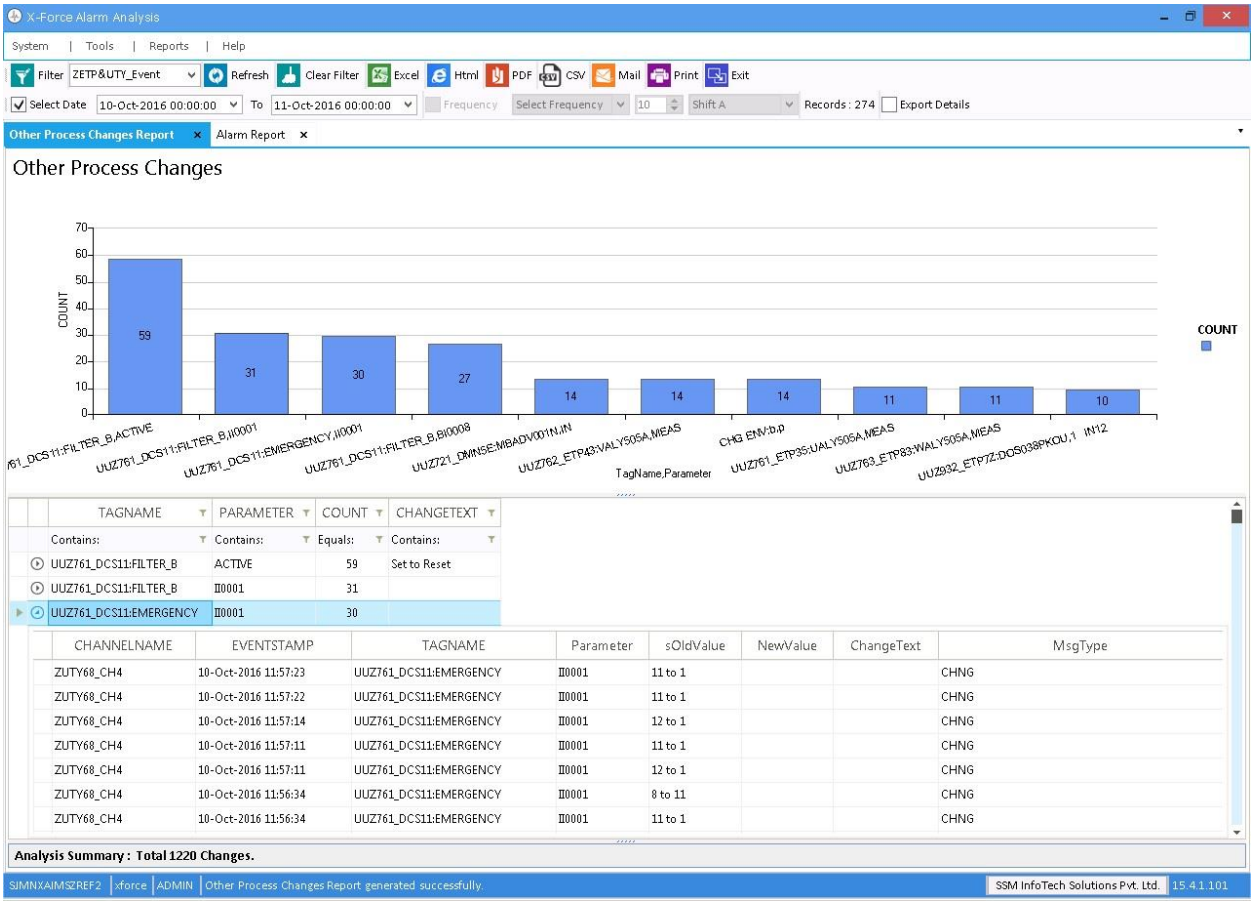
To analyze Frequent Changes Report: Follow Steps as mention below to do Analysis with Frequent Changes Report

1) Go to Reports Menu and select Process Changes, in that select Frequent Changes and click on it.
2) Click on Refresh button from Operation Toolbar.

Others Changes

The **others analysis** discovers all process changes that are not captured by any of the specific analyses described previously. This catch-all analysis enables the convenient evaluation of miscellaneous changes.

Navigation: Report Menu -> Process Changes -> Others Changes



To analyze others Changes Report: Follow Steps as mention below to do Analysis with Others Changes Report

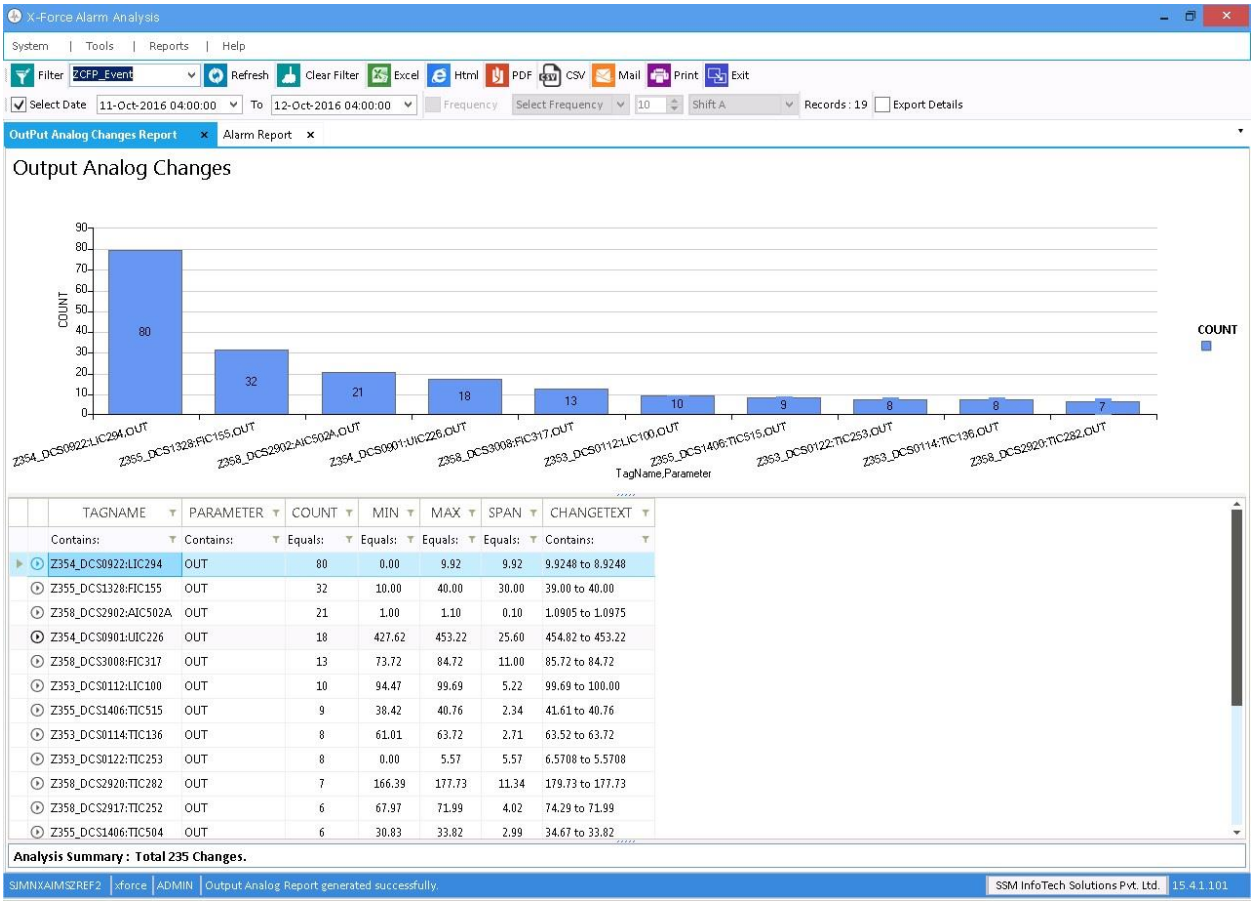
1) Go to Reports Menu and select Process Changes, in that select Others Changes and click on it.
2) Click on Refresh button from Operation Toolbar.

Outputs -Analog changes

Output Analog Report could be useful in assessing the health control loops. Increasing variability may indicate problems with the final control element, process, or controller tuning preventing the controller from running in automatic control mode.

The **Analog Outputs** analysis results include a list of entities, and for each entity, the minimum controller output given, the maximum controller output given, the span, the number of output changes, and the entity point description. The analysis also displays the total number of output changes and the total number of unique entities with output changes.

Navigation: Report Menu -> Process Changes -> Outputs- Analog Changes



To analyze Output Analog Report: Follow Steps as mention below to do Analysis with output analog Report

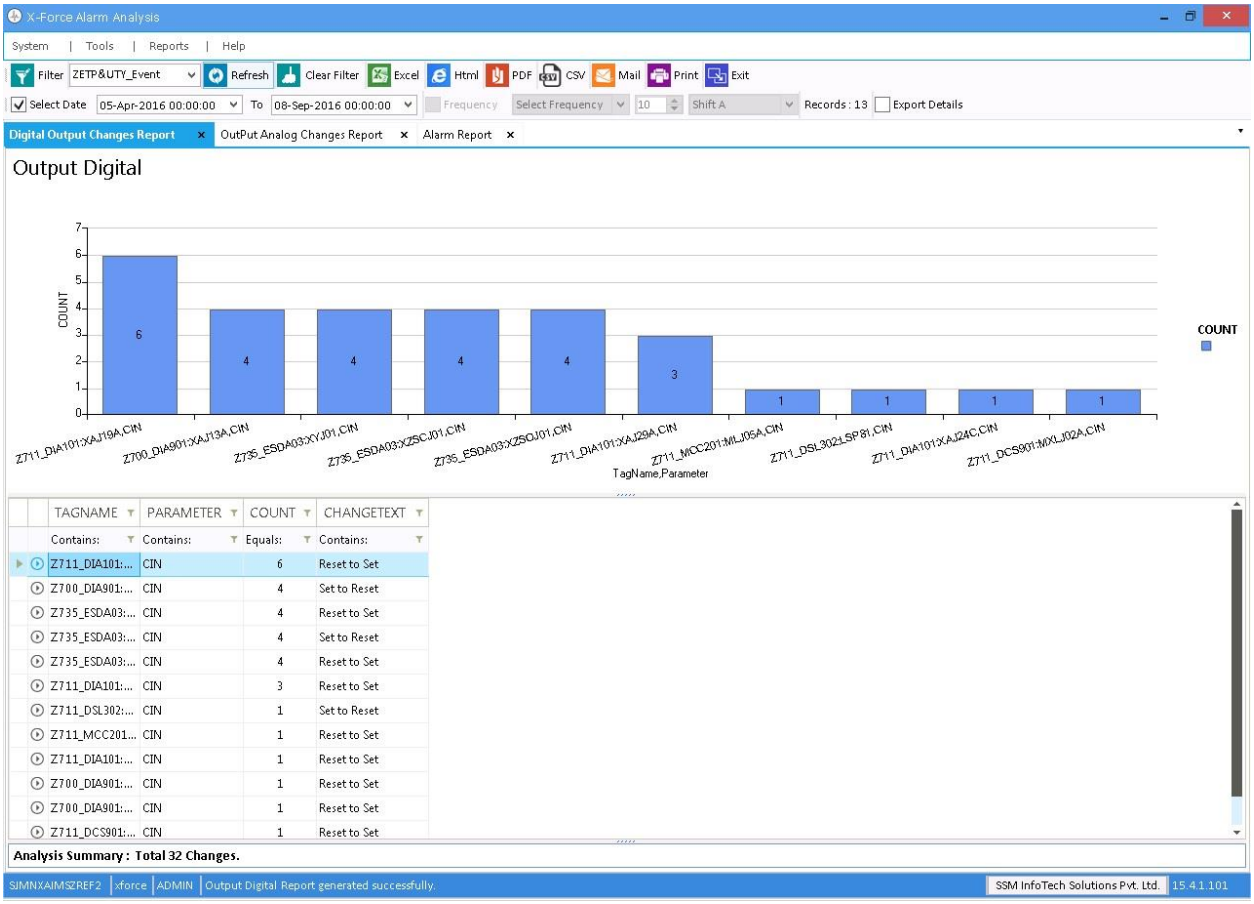
1) Go to Reports Menu and select Process Changes, in that select output Analog Report and click on it.
2) Click on Refresh button from Operation Toolbar.

Outputs - Digital changes

Output Digital Report, while not as common, serves a similar purpose. An increase in cooling fan motor starts, for example, may help pinpoint an overheating process element. The Outputs-Digital analysis reveals these variability and therefore serves as a valuable troubleshooting tool.

The Digital Outputs analysis results include a list of entities, and for each entity, the number of output changes, and the entity point description. The analysis also displays the total number of output changes and the total number of unique entities with output changes.

Navigation: Report Menu -> Process Changes -> Outputs- Digital Changes



To analyze Output Digital Report: Follow Steps as mention below to do Analysis with output Digital Report

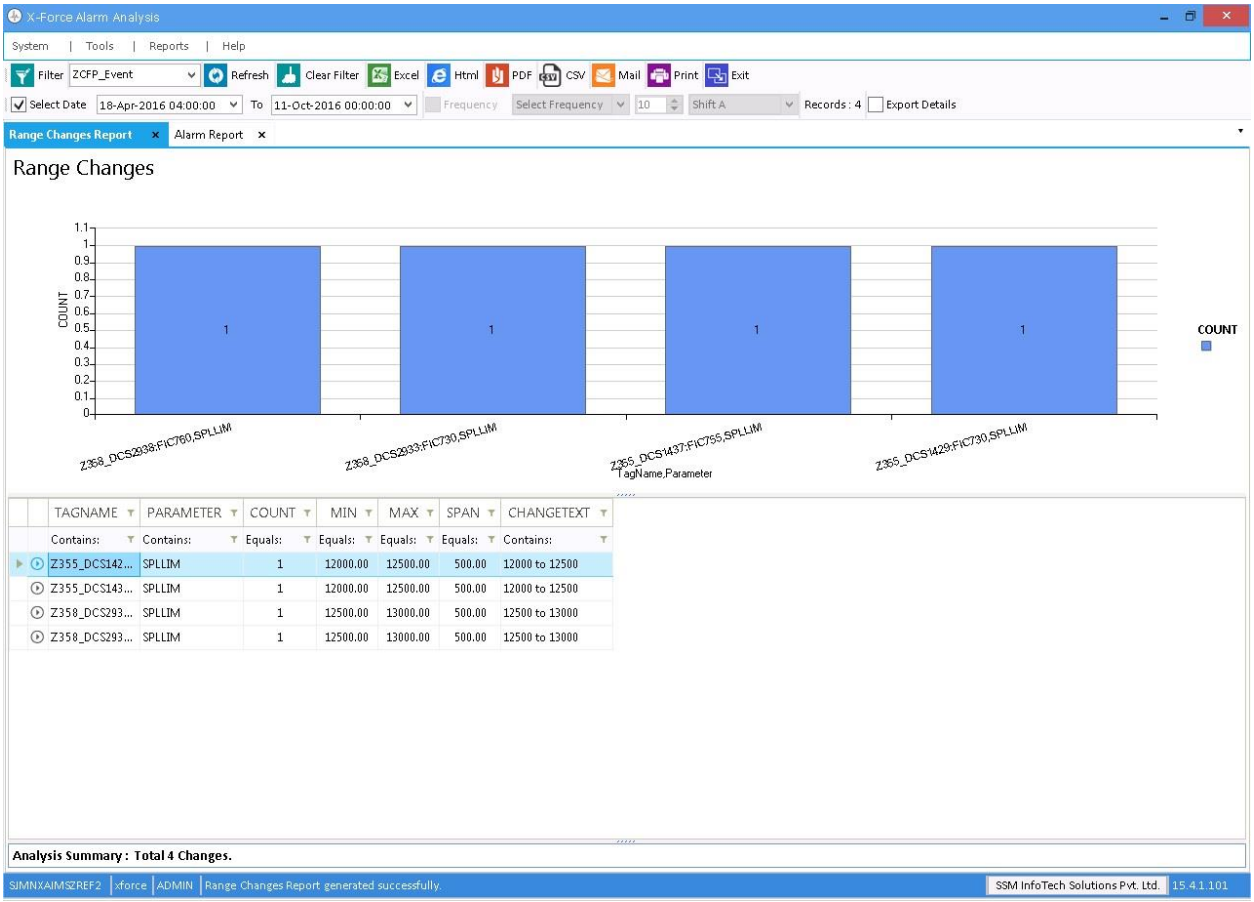
1) Go to Reports Menu and select Process Changes, in that select output Digital Report and click on it.
2) Click on Refresh button from Operation Toolbar

Ranges

The **Ranges** analysis detects changes made in ranges associated with the Process Value (PV) (e.g., for a Honeywell system these would be PVEULO, PVEUHI, etc.).

The analysis results include a list of entities, and for each entity, the range that changed, the number of times the range changed, and the entity point description. The analysis also displays the total number of range changes and the total number of unique entities with range changes. From-value/to-value information is also available.

Navigation: Report Menu -> Process Changes -> Ranges



To analyze Output Digital Report: Follow Steps as mention below to do Analysis with Ranges Report

1) Go to Reports Menu and select Process Changes, in that select Ranges Report and click on it.
2) Click on Refresh button from Operation Toolbar.

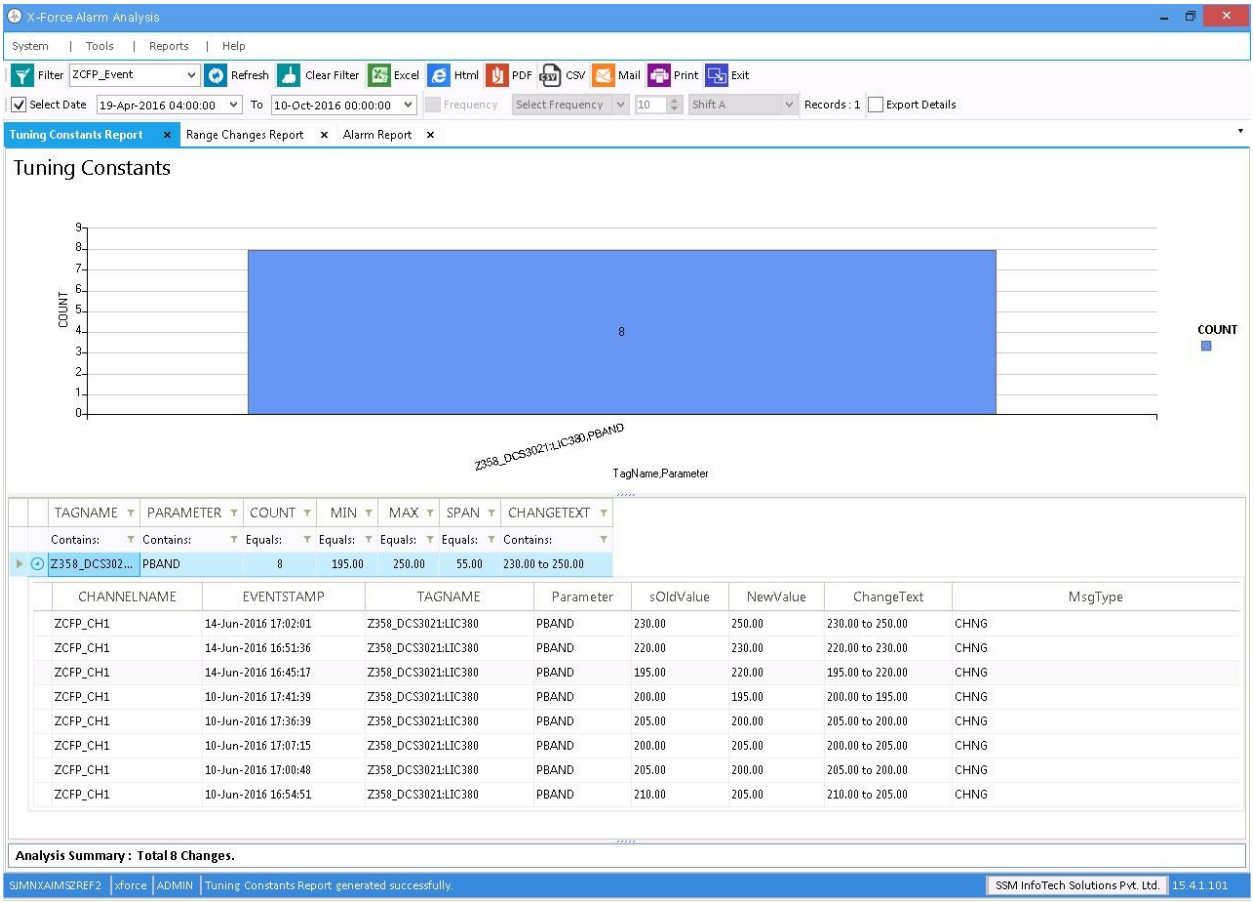
Tunning Constants

The **Tuning Constants** analysis summarizes changes to the standard PID tuning constants for gain, integral action, and derivative action. This information is valuable in determining bad actors (which may need final element work, such as a new positioner, volume booster, stem packing, valve trim, etc.) or candidates for non-traditional control algorithms (e.g., non-linear, feed-forward, gap, etc.).

The analysis results include a list of entities, and for each entity, the tuning constant that changed, the number of times the tuning constant changed, and the entity point description. The analysis also displays the total

number of tuning constant changes and the total number of unique entities with tuning constant changes. From-value/to-value information is also available.

Navigation: Report Menu -> Process Changes -> Tunning Constants



To analyze Tunning Constants Report: Follow Steps as mention below to do Analysis with Tunning Constants Report

1) Go to Reports Menu and select Process Changes, in that select Tunning Constants Report and click on it.
2) Click on Refresh button from Operation Toolbar.

General Calculating terminologies

Average: constituting the result obtained by adding together several amounts and then dividing this total by the number of amounts.

Peak: Peak is the maximum value among all value.

Median: the middle value in a series of values arranged from smallest to largest.

Alarm Count: Total occurrences of Relevant Alarm event.