



SafePool

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SAFEPOOL

Digital Safety



What SafePool does ?





Process Hazard Analysis

1. Step

Define Critical Equipments

DOW FE&I

Risk Assessment

HAZOP - FTA/ETA Studies

2. Step

3. Step

Consequence Analysis

Modelling, ERPs





SafePool

New Step

Industry-leading software, created with Tüpraş resources, that monitors the protection barriers of equipment critical to Process Safety in an online and measurable manner, keeping risk analysis studies up-to-date.



1.Step : Define Critical Equipments

 114 -Catastrophic

 155

 215

 153

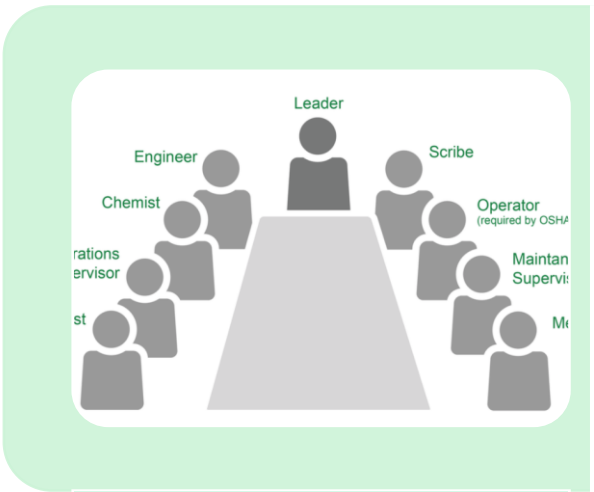
 127

764

Static Equipments



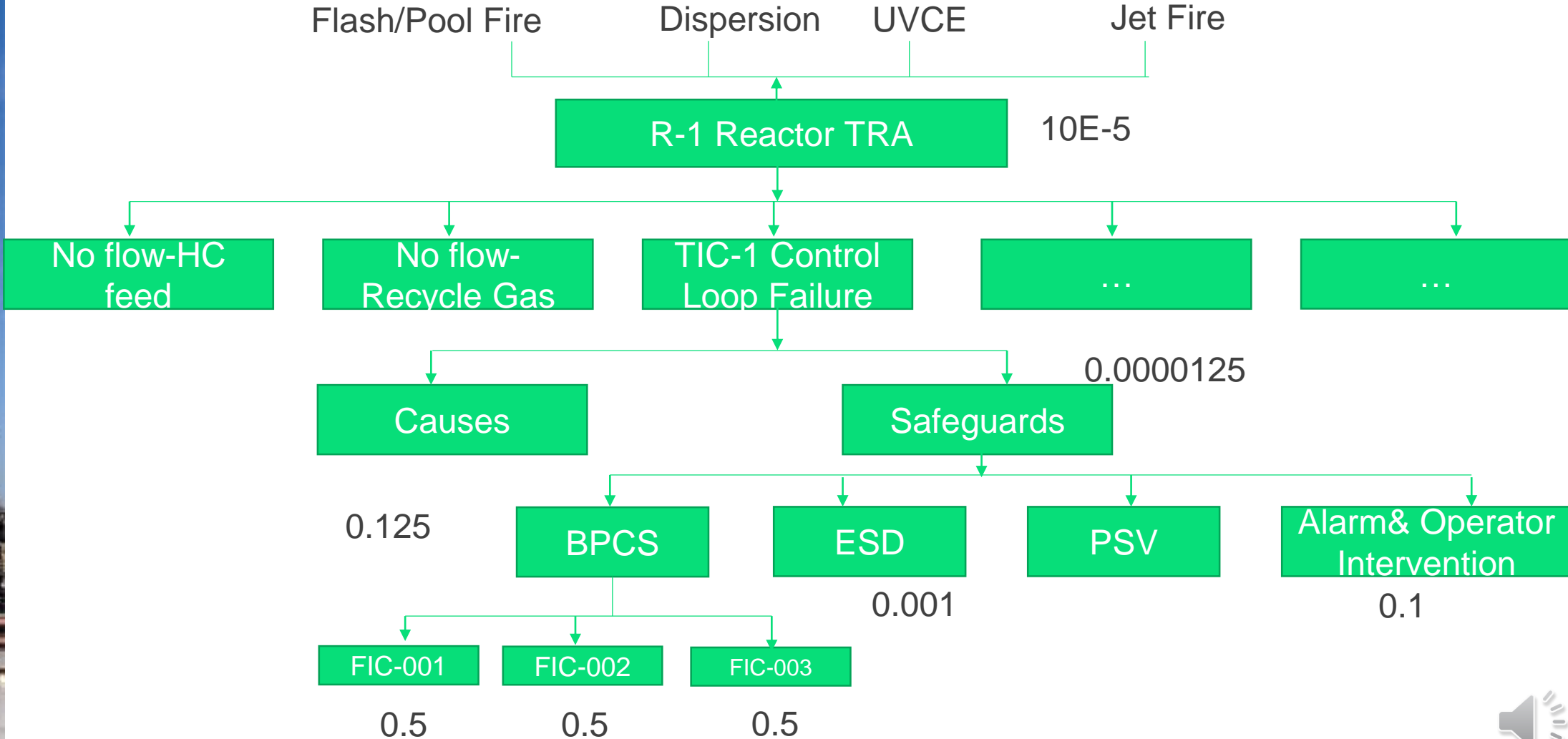
2. Step : Risk Assessment

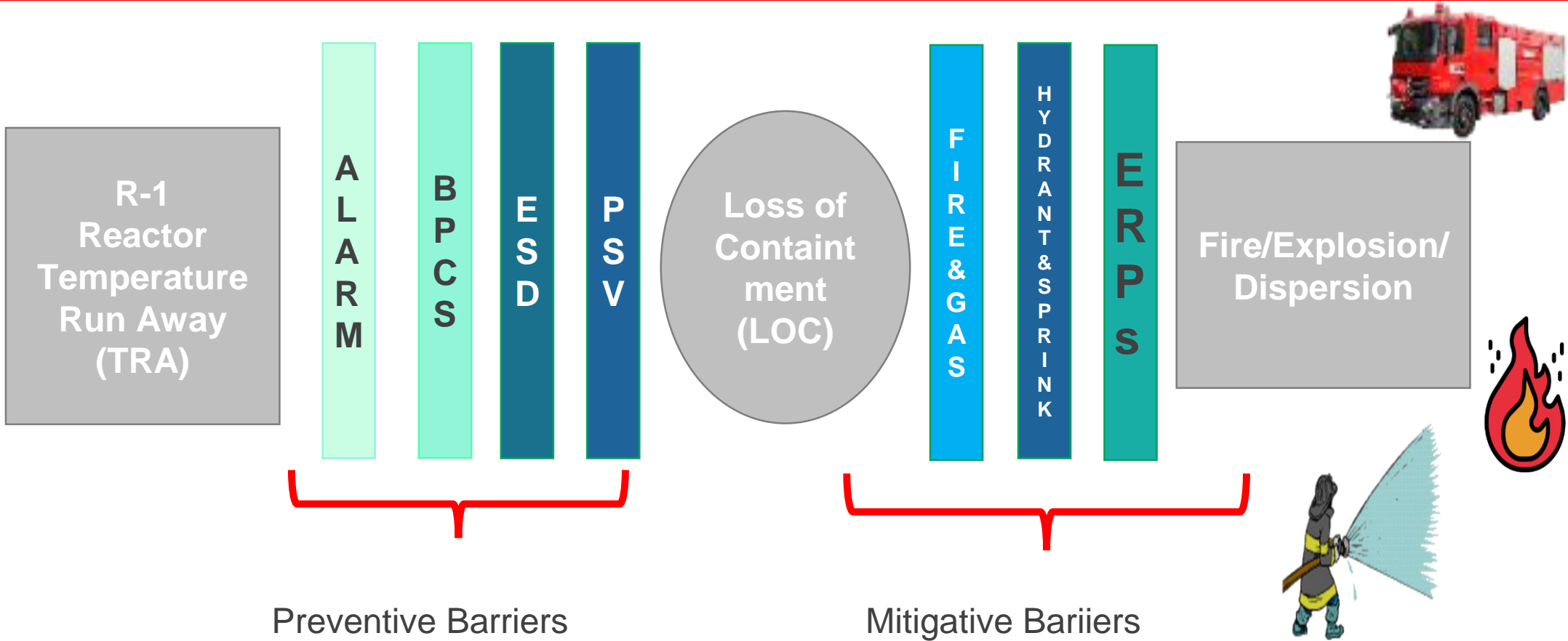


HAZOP



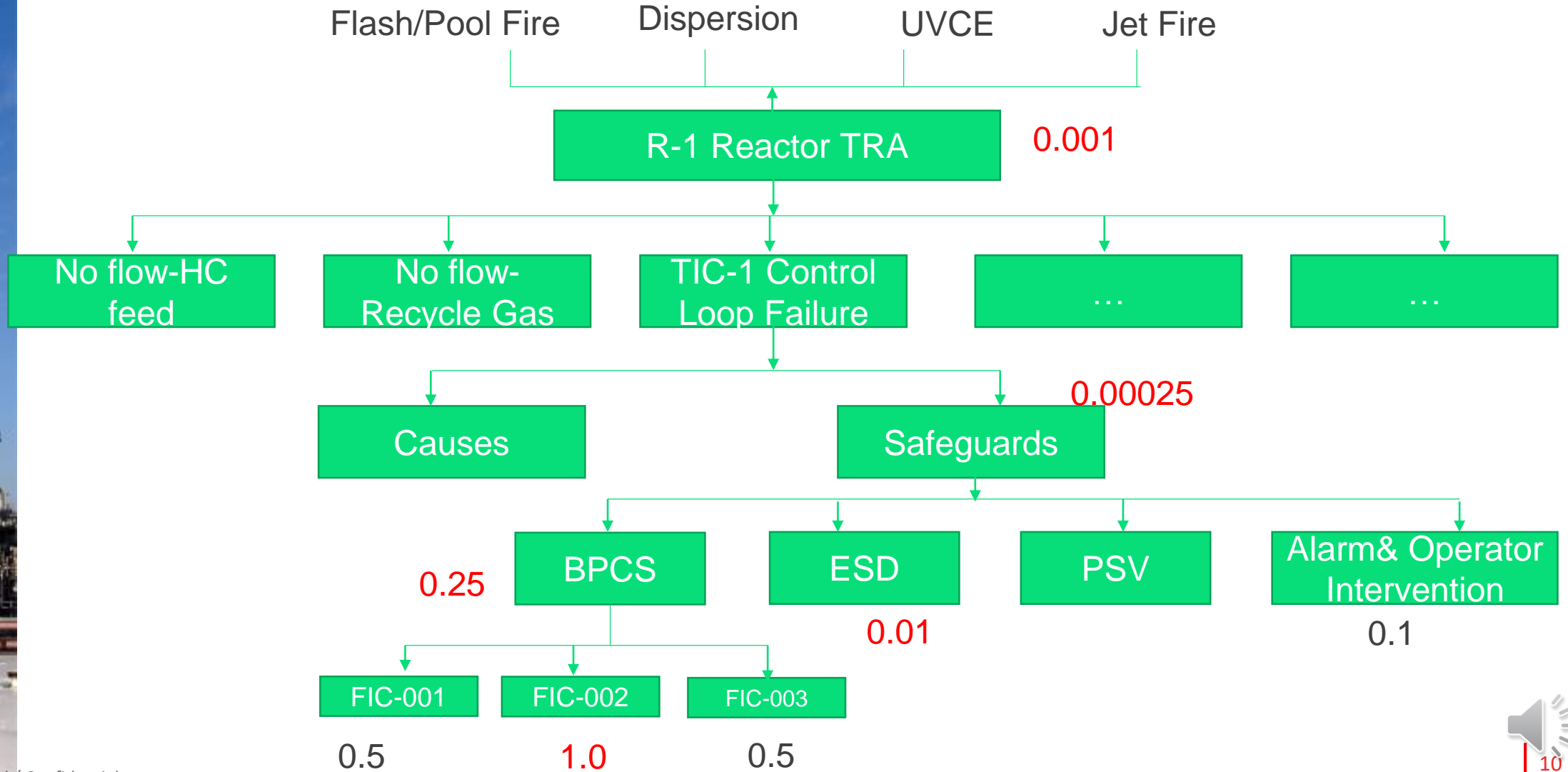
Fault Tree Analysis-Event Tree Analysis





So where will SafePool be in this process?

Fault Tree Analysis-Event Tree Analysis



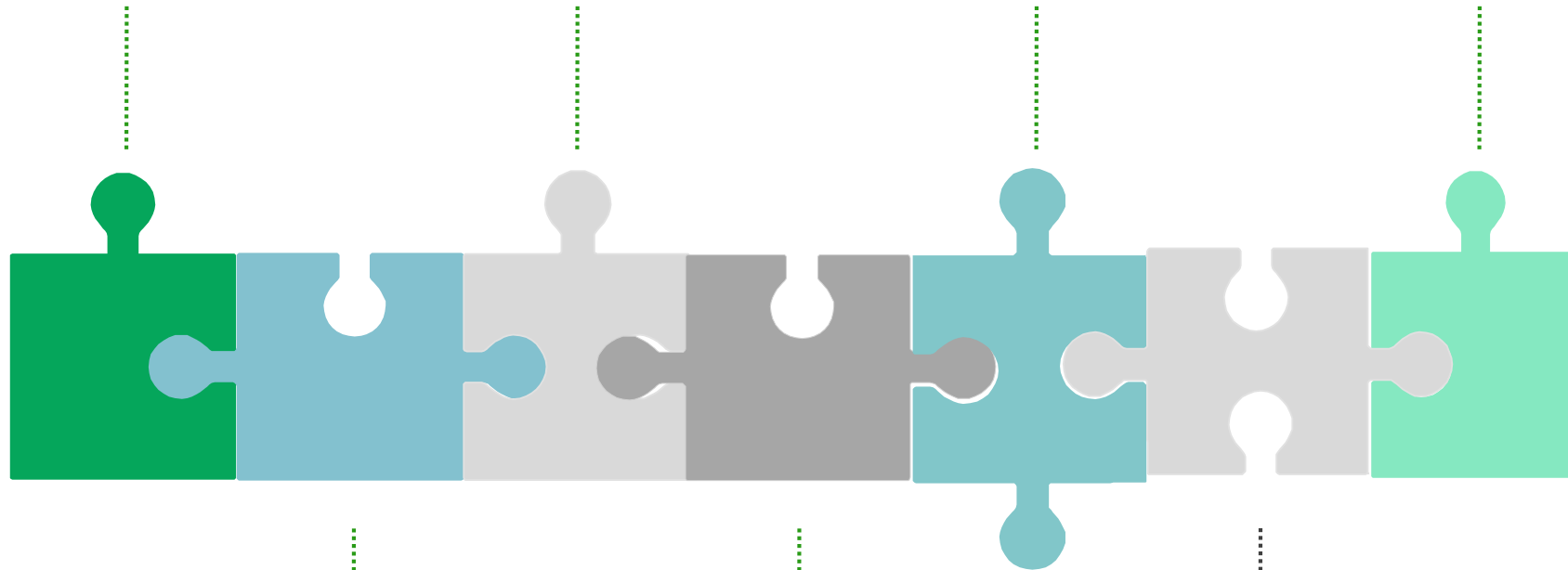
SafePool Control Check

Process Value
Freeze

Process Value
Anomaly

Control Mode
Manuel

Alarm Off
Problem



Channel and
IOP Problem

Valve
Out of Control

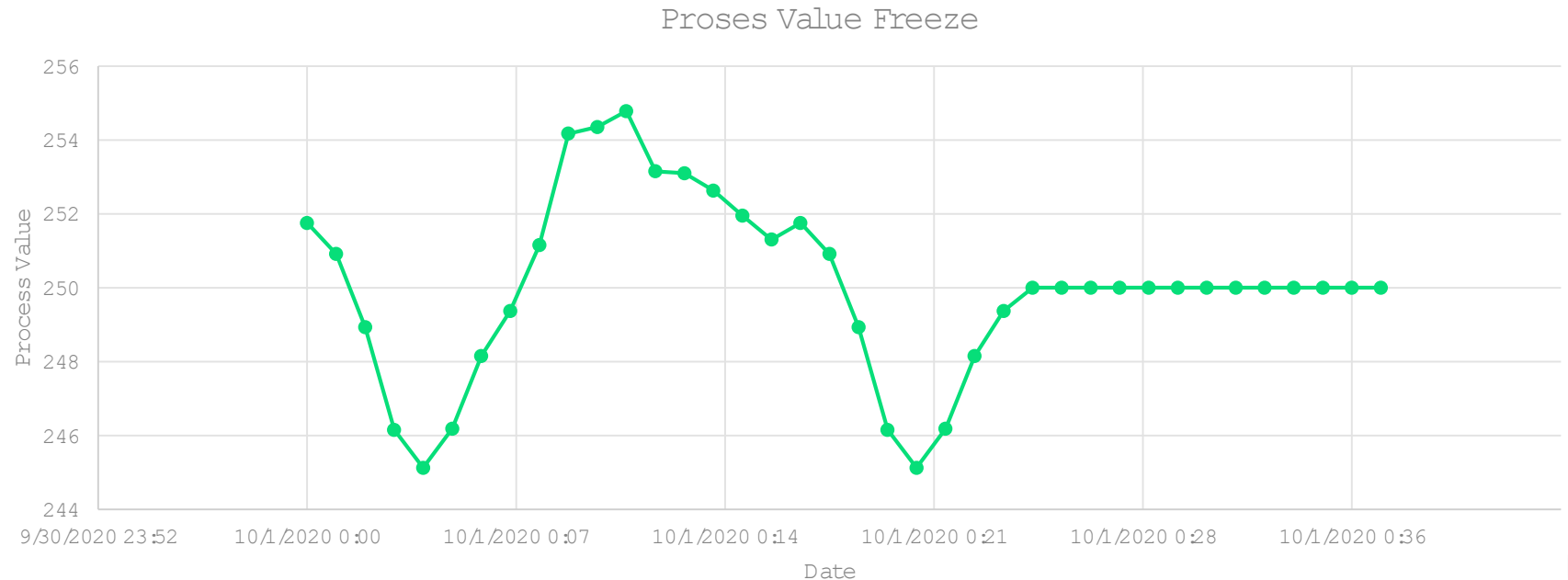
ESD ByPass



Process Value Freeze

Aim: To detect when there is no change in the process value for a specific tag

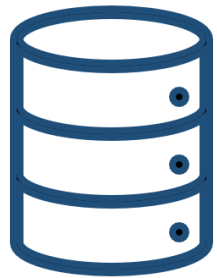
Function: Take the last ten minutes of process value as the input and compare whether there is any change or not in that time window. If the values are all same, assign process value freeze for that tag to 1.



Channel and IOP Problem

Aim: To detect when there is any important system alarm for a specific tag.

Function: Monitor the system alarm database hourly, and if there is any record related with the specific tag assign channel problem for that tag to 1



System Alarm
Database



«Node 07 Slot 01
Channel 05» IOP+



Tag	Channel Problem
PI01C	1
PI01B	0



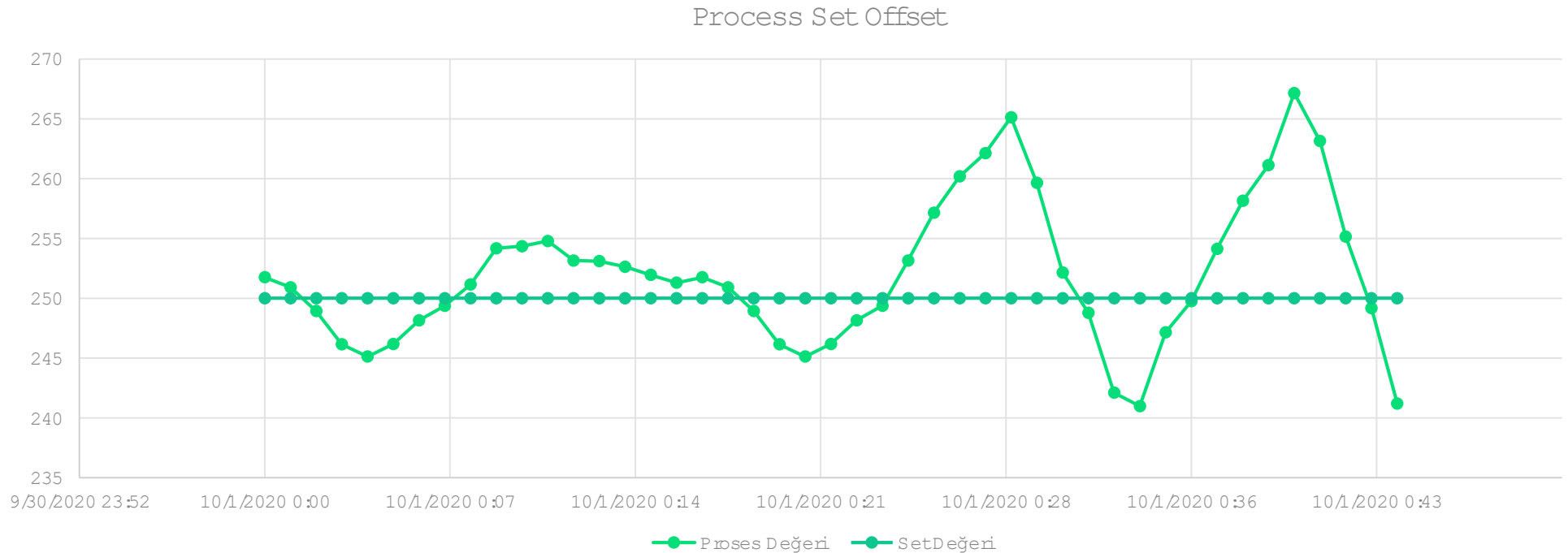
«Node 07 Slot 01
Channel 05» ==
PI01C



Process Value Anomaly

Aim: To detect abnormal change in process value for a given tag.

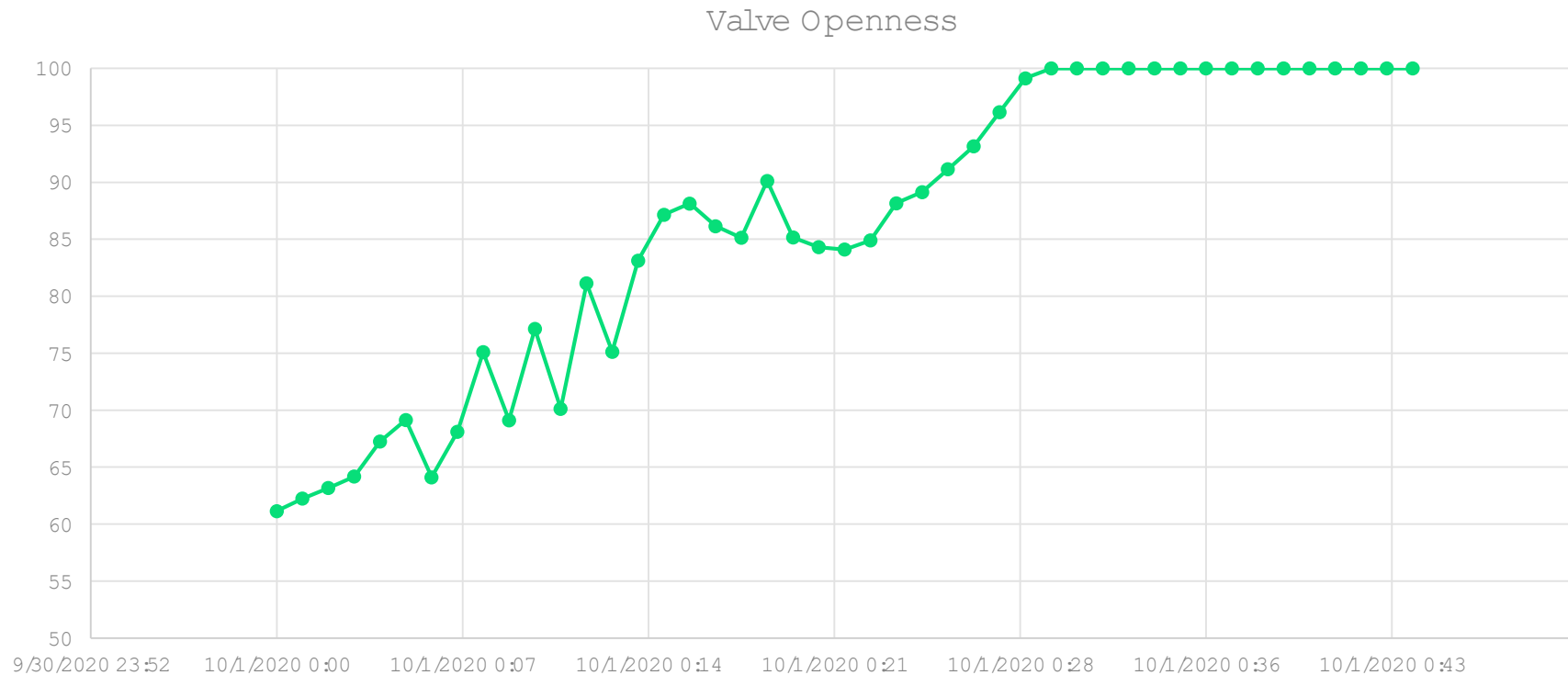
Function: Calculate the difference between set and process value for that tag. The difference and standard deviation of this difference are compared to the thresholds defined by operation team of the related unit.



Valve Out of Control

Aim: To detect when the valve openness is too close to fully open or fully close so that the controller might not make an effective prevention.

Function: Take the last twenty minutes of valve openness value as the input, and if all the values are above 90% or below 10% , then assign valve out of control value for that tag to 1.



Control Mode

Aim: To detect whether a control mode is manual or not for a specific tag

Function: Monitor operator action database hourly, and if there is a record for changing control mode to manual, then assign control mode value for that tag to 1.



Operator Action
Database



FIC01 Mode MAN
old AUT

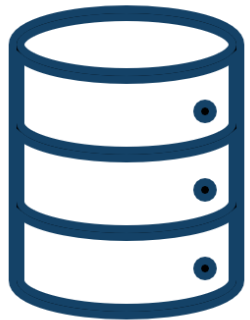


Tag	MODE
FIC01	1
FIC02	0

ESD By-Pass

Aim: To detect whether ESD tag's state is by-pass or not

Function: Monitor operator action database hourly, if there is a record for bypass action, assign by-pass value for that tag to 1



System Alarm
Database



FT01_BP ByPass
Overriden

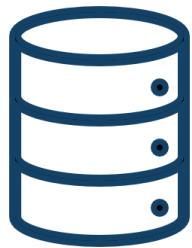


Tag	BYPASS
FT01_BP	1
FT02_BP	0

Alarm Off Problem

Aim: To detect whether an alarm for a tag is set to off.

Function: Monitor operator action database hourly, if there is a record for alarm off, assign alarm value for that tag to 1



Operator Action
Database



FIC03 HH: 100
old: 75



Tag	ALARM OFF
FIC03	1
FI04	0





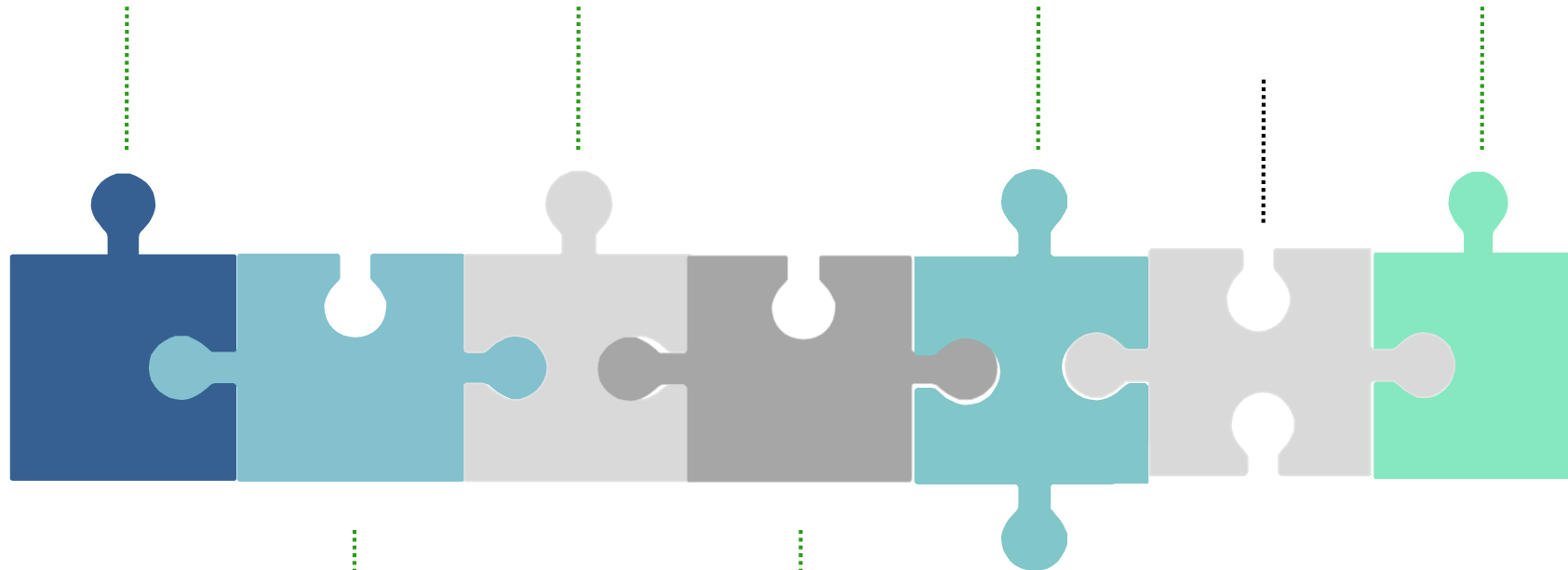
Process Value
Freeze

Process Value
Anomaly

Control Mode
Manuel

Alarm Off
Problem

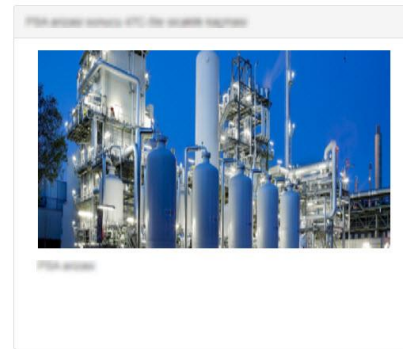
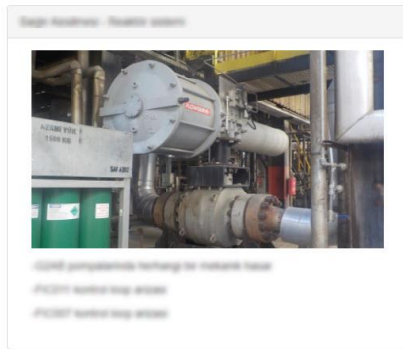
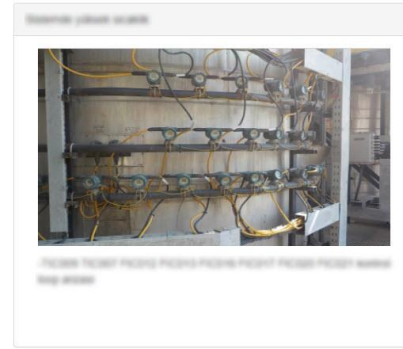
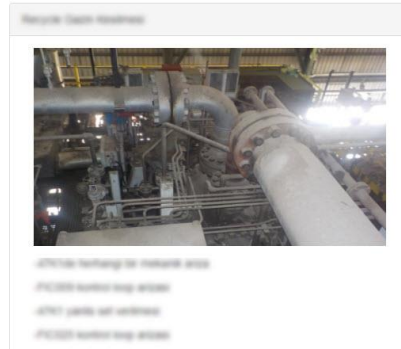
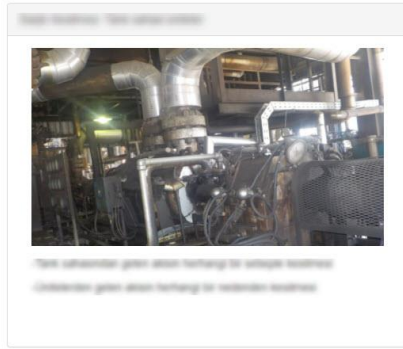
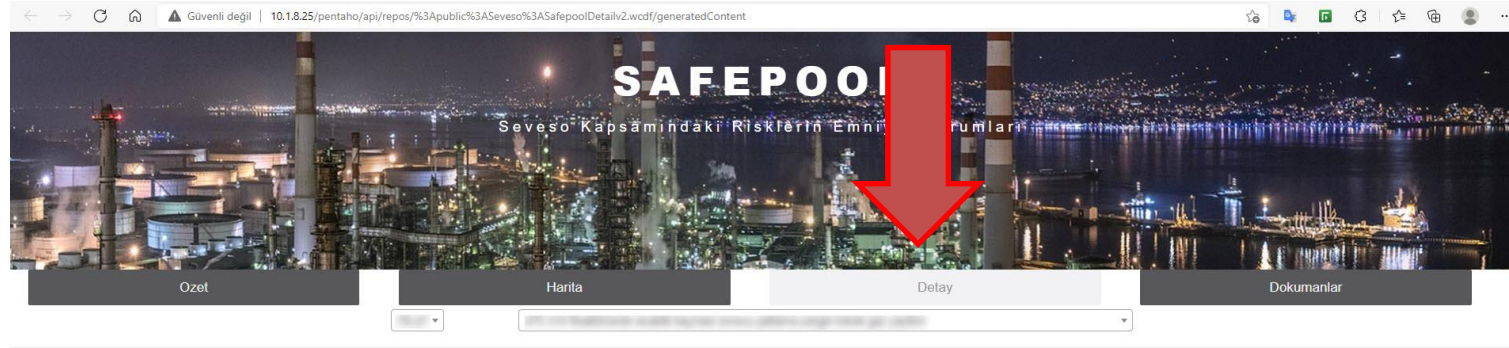
ESD ByPass



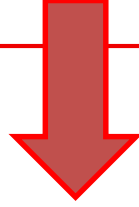
Channel and
IOP Problem

Valve
Out of Control





SafePool



(Basic Process Control System)

Temel Proses Kontrol

ESD

Alarm

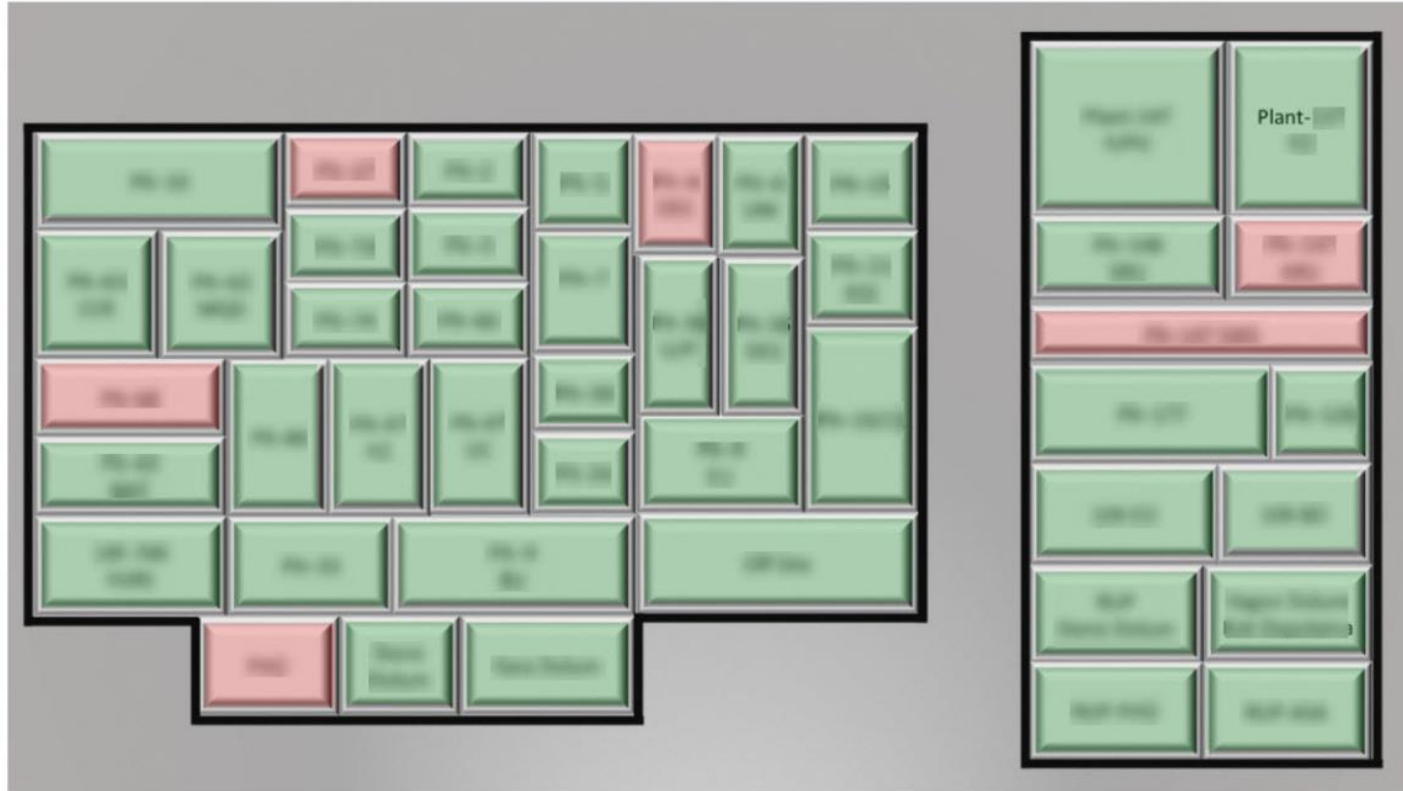




Problemlili Temel Proses Kontrol Elemanları

Tag	Unite	Aciklama	Freeze	Kart	IOP	StdDev	SetTracking	VanaAcikligi	ControlMode
			✓	✓	✓	✓	✓	✓	✗
			✓	✓	✓	✓	✓	✓	✗
			✓	✓	✓	✓	✓	✓	✗
			✓	✓	✓	✓	✓	✓	✗
			✓	✓	✓	✓	✓	✓	✗
			✓	✓	✓	✓	✓	✓	✗
			✓	✓	✓	✓	✓	✓	✗
			✓	✓	✓	✓	✓	✓	✗
			✗	✓	✓	✓	✓	✓	✗
			✓	✓	✓	✓	✓	✓	✗





Risk Değerleri

Senaryo	Olayın Olma Frekansı	Jet Yangini	Buhar Bulutu Patlaması	Flash/ Havuz Jet Yangini	Yayılım
1. Senaryo	1.000/yıl	1.000/yıl	1.000/yıl	1.000/yıl	1.000/yıl
2. Senaryo	1.000/yıl	1.000/yıl	1.000/yıl	1.000/yıl	1.000/yıl

Detay bilgi için lütfen tıklayınız [Detay Sayfası](#)



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Gökhan Gedik



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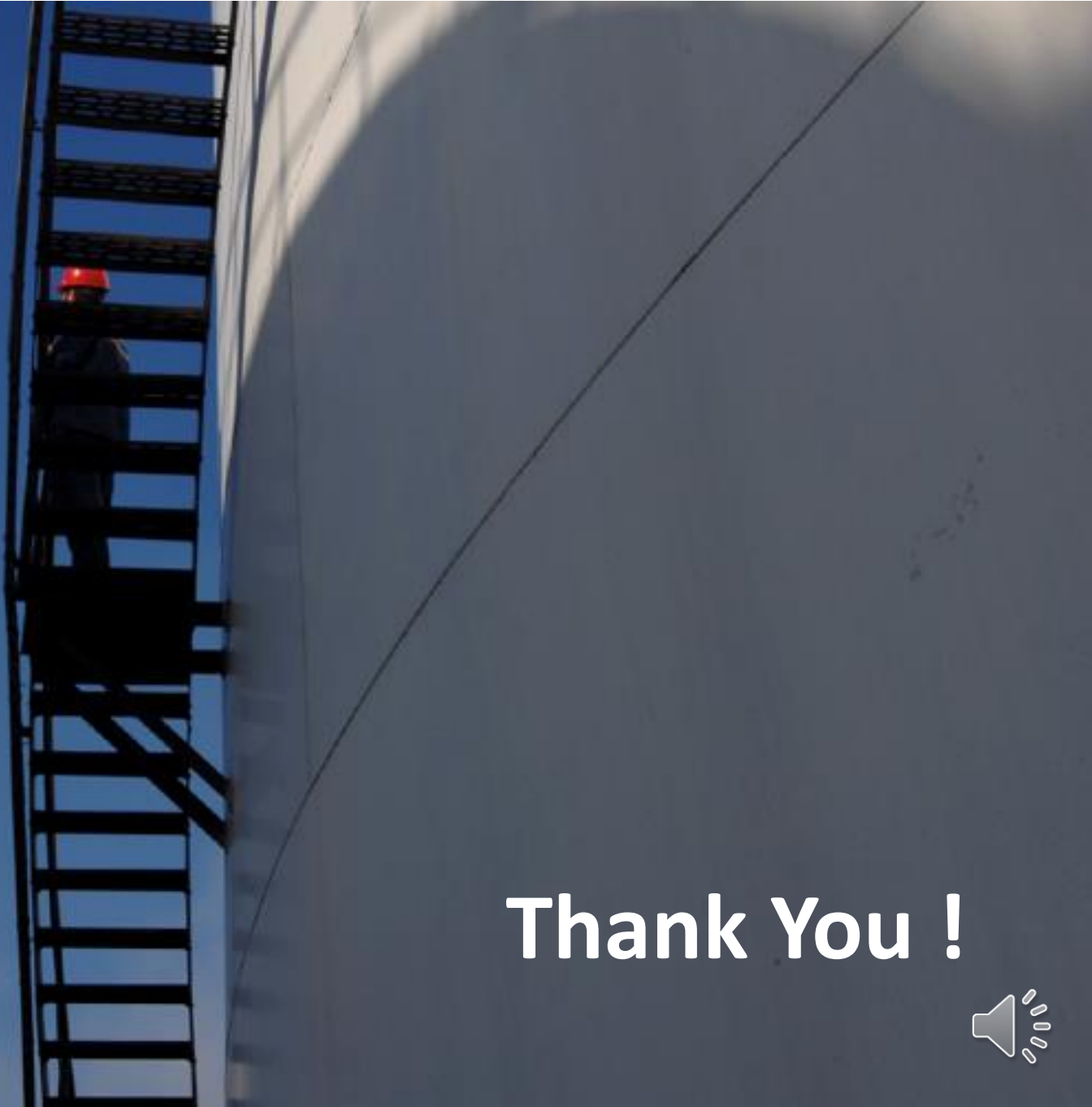
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Tüpraş



Thank You !



 Koç

Hizmete Özel / Confidential