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Operationalizing Process Hazard Analysis Recommendations with Seeq

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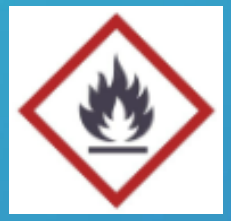
Aditya Birla Chemicals PSM Facility in Dalton, Georgia



- Epichlorohydrin
- Flammable solvents
- Formalin

About Me & The Manufacturing Technology Engineer Role

Maintain Process Safety Information

Process Safety Improvements

Hazard Assessment and Safety Audit Site Facilitator.

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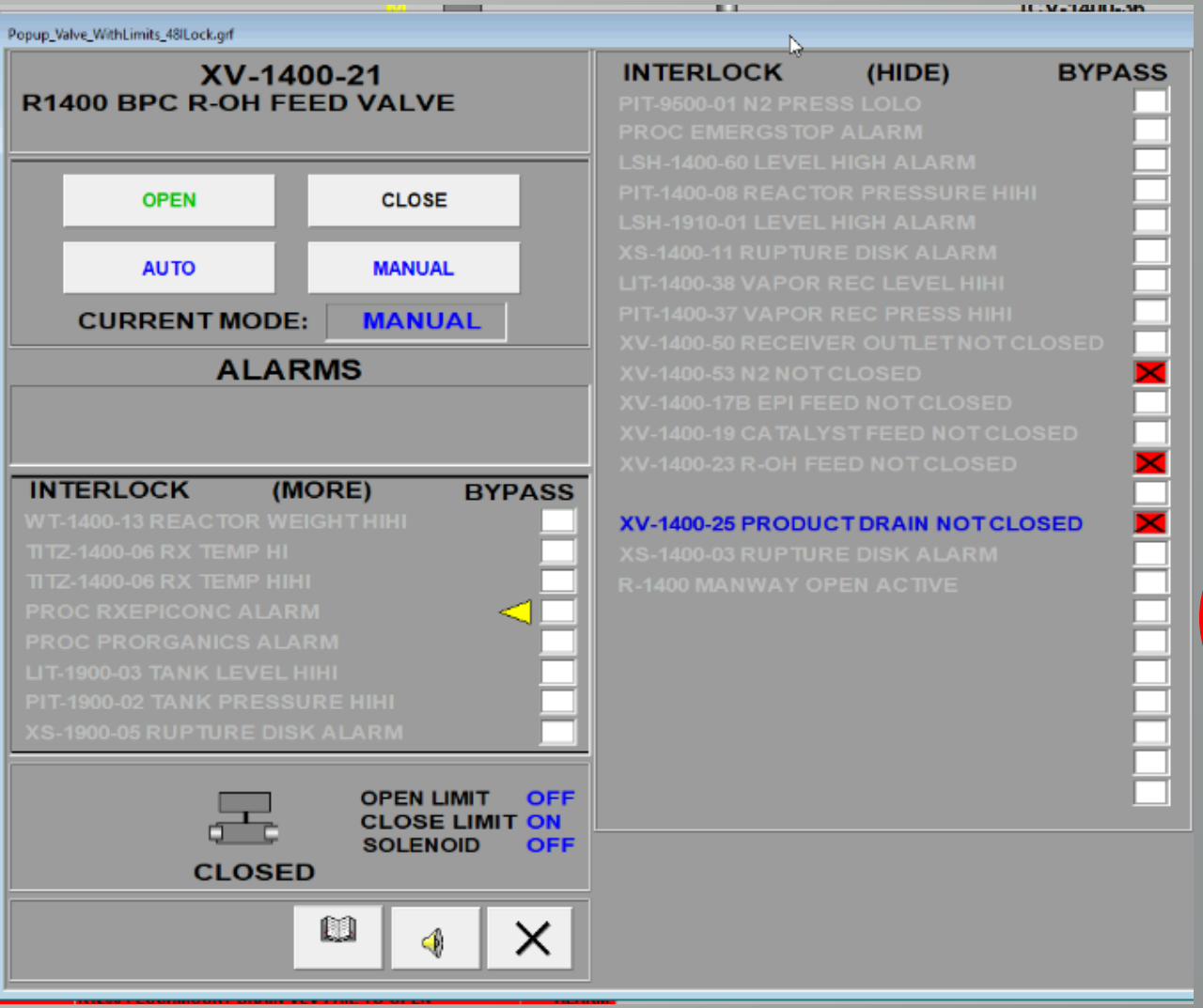
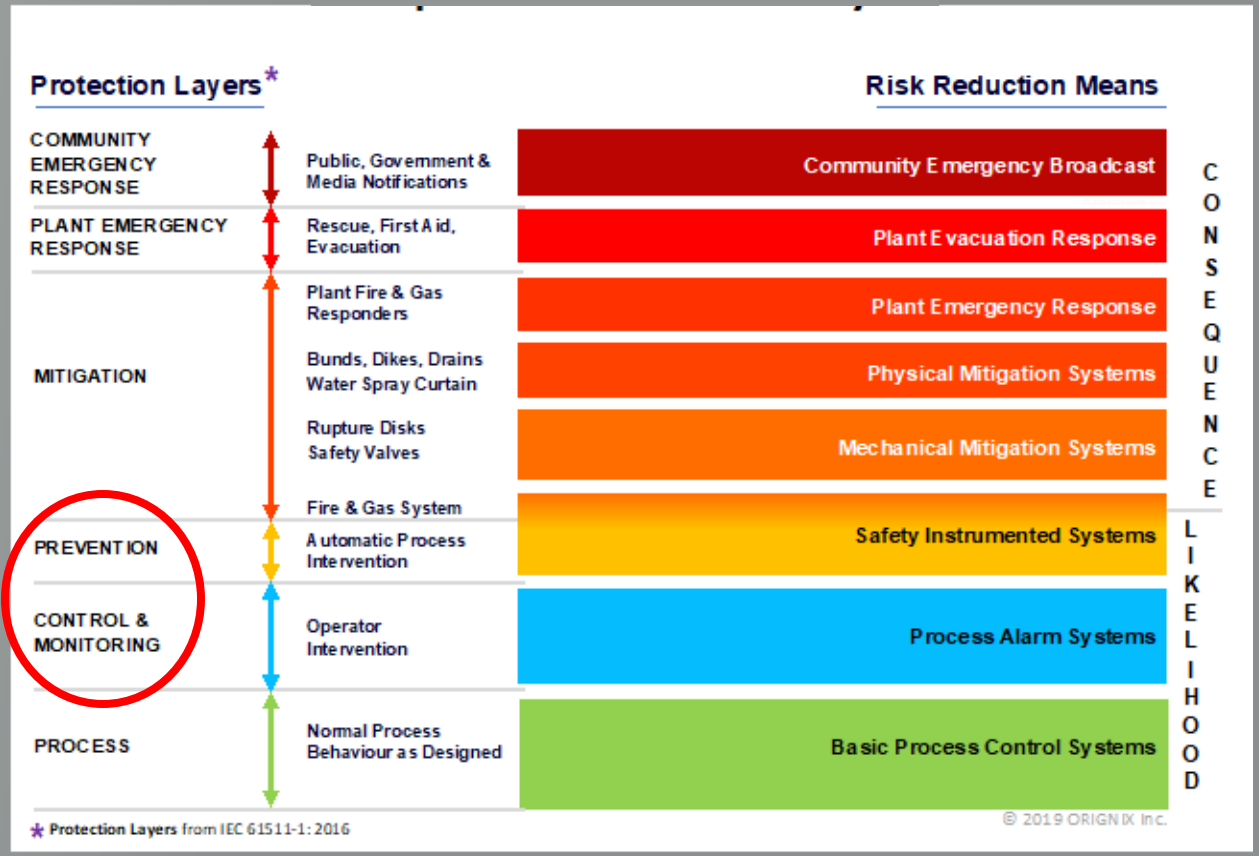
Uncovered Unknown Safety Interlocks Bypassed During PHA





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Problem: Interlocks Bypassed on Unknown Number of Output Devices

100 + output devices with potential bypasses applied.

Needed visibility on where and how long bypasses have been applied.

Need dynamic reporting for interlock bypassing on output devices.

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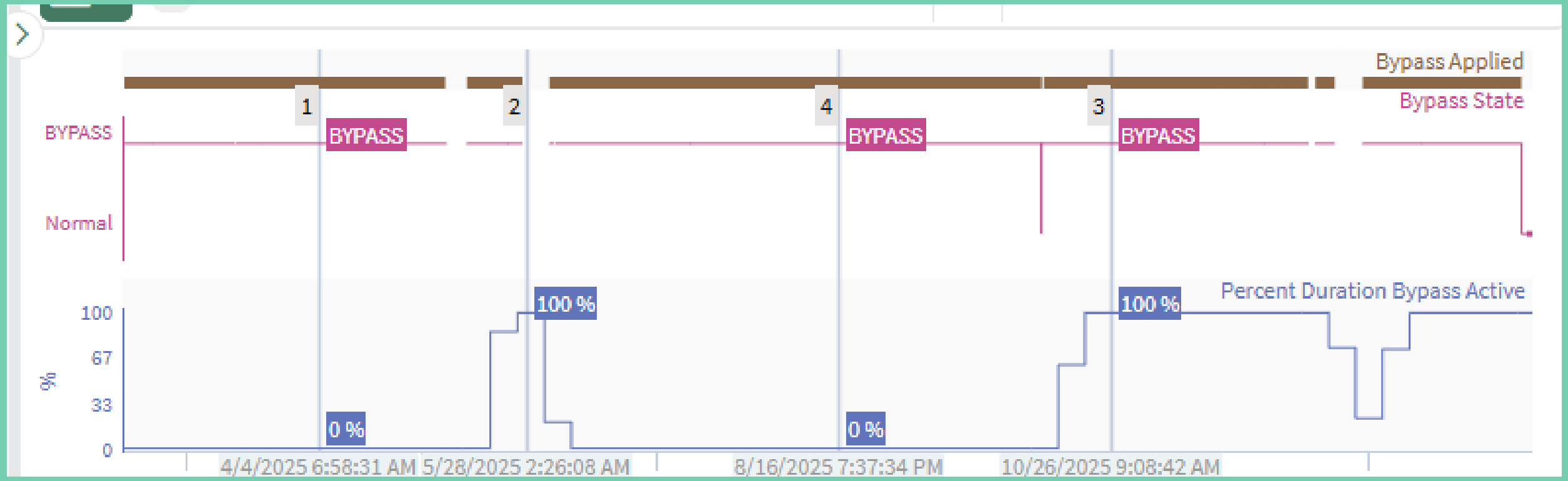
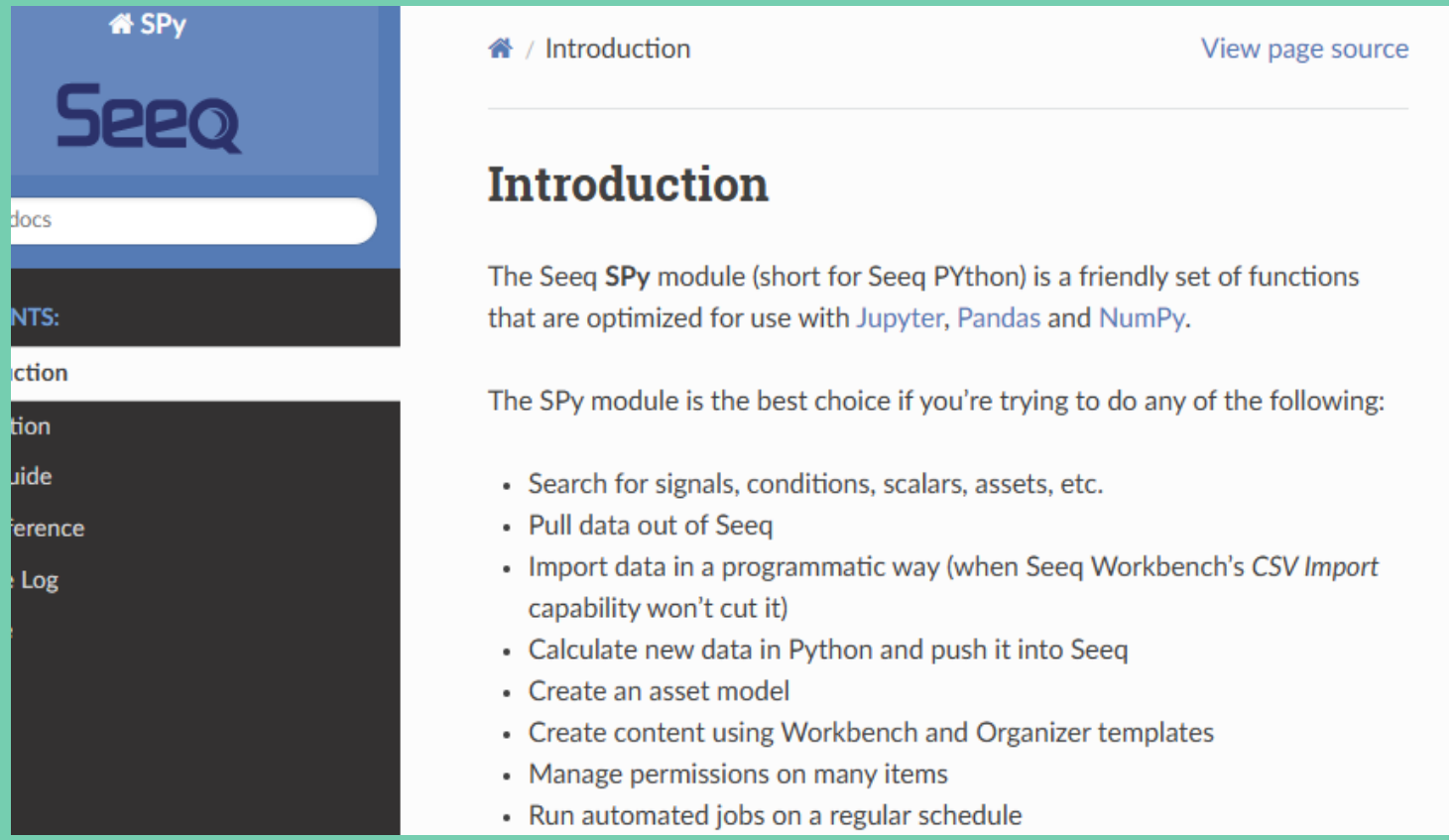
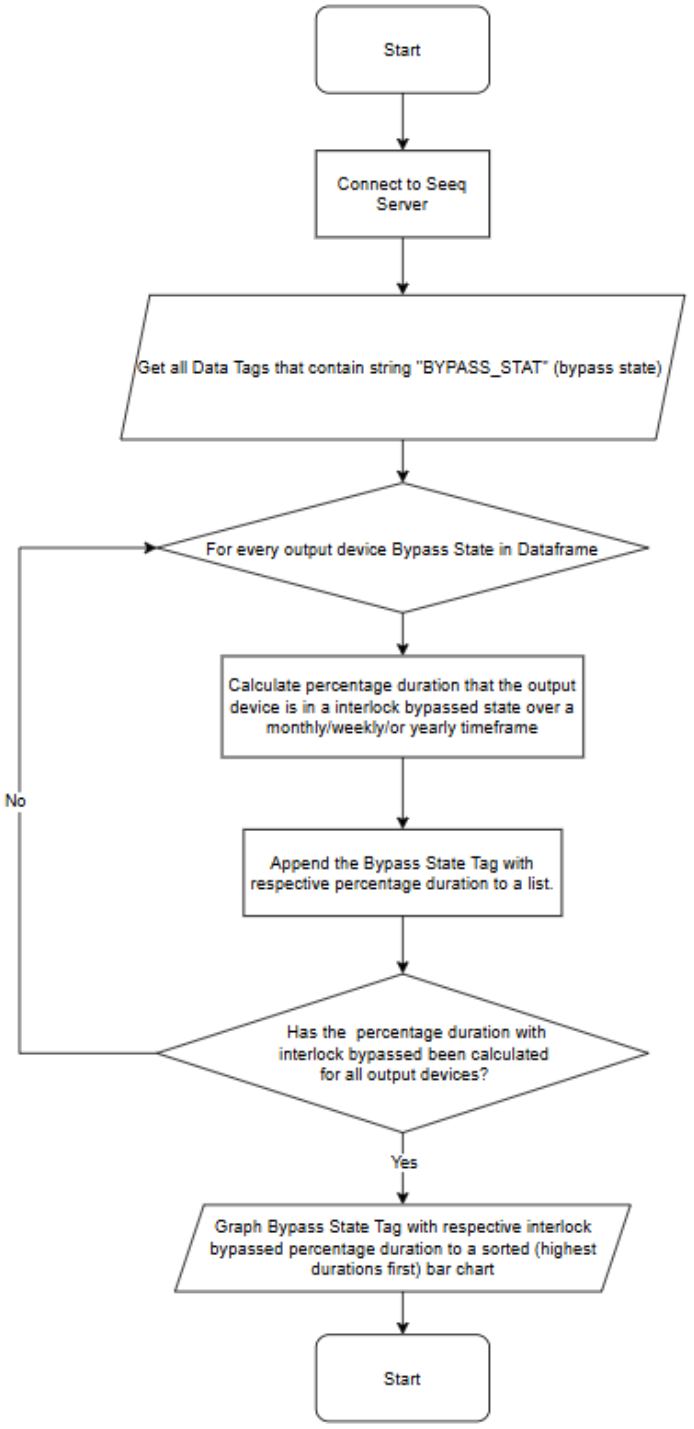
Solution (Part 1): Using Seeq Workbench to Determine Methodology



Solution (Part 2): Using Seeq SPy Python Module to Automate Interlock Bypass Analysis





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Solution (Pt 3a): Overview of the Simplistic code using Seeq SPy Module

```python
from seeq import spy
import pandas as pd

# Set the compatibility option so that you maximize the chance that SPy will remain compatible with your notebo
spy.options.compatibility = 198
```

```python
# Log into Seeq Server if you're not using Seeq Data Lab:
spy.login(url='https://adityabirlachemicals.seeq.tech/', credentials_file='../credentials.key', force=False)
```

Connect to Seeq Database

```python
all_tag_names = spy.search({
    'Name': 'BYPASS_STAT'
})

all_tag_names
```

Query successful

	Name	Time	Count	Pages	Result
0	BYPASS_STAT	00:00:00.27	192	1	Success

	ID	Name	Description	Type	Value Unit Of Measure	Datasource Name	Archived
0	0F047B8D-AA92-EC80-AA7F-70BDF008F0CC	DALT:XV-1300-25_BYPASS_STAT	XV-1300-25 BYPASS STATUS	StoredSignal	string	OSDALT03MP	False
1	0F047B8D-AA9C-E8C0-A15A-272D9516026F	DALT:XV-1300-45_BYPASS_STAT	XV-1300-45 BYPASS STATUS	StoredSignal	string	OSDALT03MP	False
2	0F047B8D-AAA6-7500-B3AC-CF045B62DF21	DALT:XV-1300-50_BYPASS_STAT	XV-1300-50 BYPASS STATUS	StoredSignal	string	OSDALT03MP	False

Get bypass state tags

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Solution (Pt 3b): Overview of the Simplistic code using Seeq Spy Module

```python
from datetime import datetime
from dateutil.relativedelta import relativedelta
# Current date and time
first = datetime.now()

# Subtract one month
last_month_start = first- relativedelta(months=1)
```

```python
duration_array = []
i = 0
for tagname in bypass_stat_full_tags['Name']:
    mytag = spy.search({'Name':tagname})
    myresult = spy.pull(mytag,
                start = last_month_start.strftime('%Y-%m-%d'),
                end  = first.strftime('%Y-%m-%d'),
                calculation = '($signal == "BYPASS").setMaximumDuration(30day).aggregate(percentDuration(), months("US/Eastern"),middleKey())',
                grid = None)
    myduration_val = myresult.to_numpy()
    myduration_tag = bypass_stat_full_tags.iloc[i]['Name']
    duration_array.append([myduration_val.item(0), myduration_tag])
    i = i+1
    print(i)
#duration_array
```

Pull successful from **2026-03-16 00:00:00-04:00** to **2026-04-16 00:00:00-04:00**

	ID	Type	Name	Time	Count	Pages	Data Processed	Result
0	0F047B8F-7593-EAA0-B06A-11680F95457E	StoredSignal	DALT:XVZ-3000-35_BYPASS_STAT	00:00:00.10	2	1	5 KB	Success

192

Define Periodic Condition (“Monthly’)

For each bypass state, calculate the percentage duration that an output device has an interlock bypassed monthly

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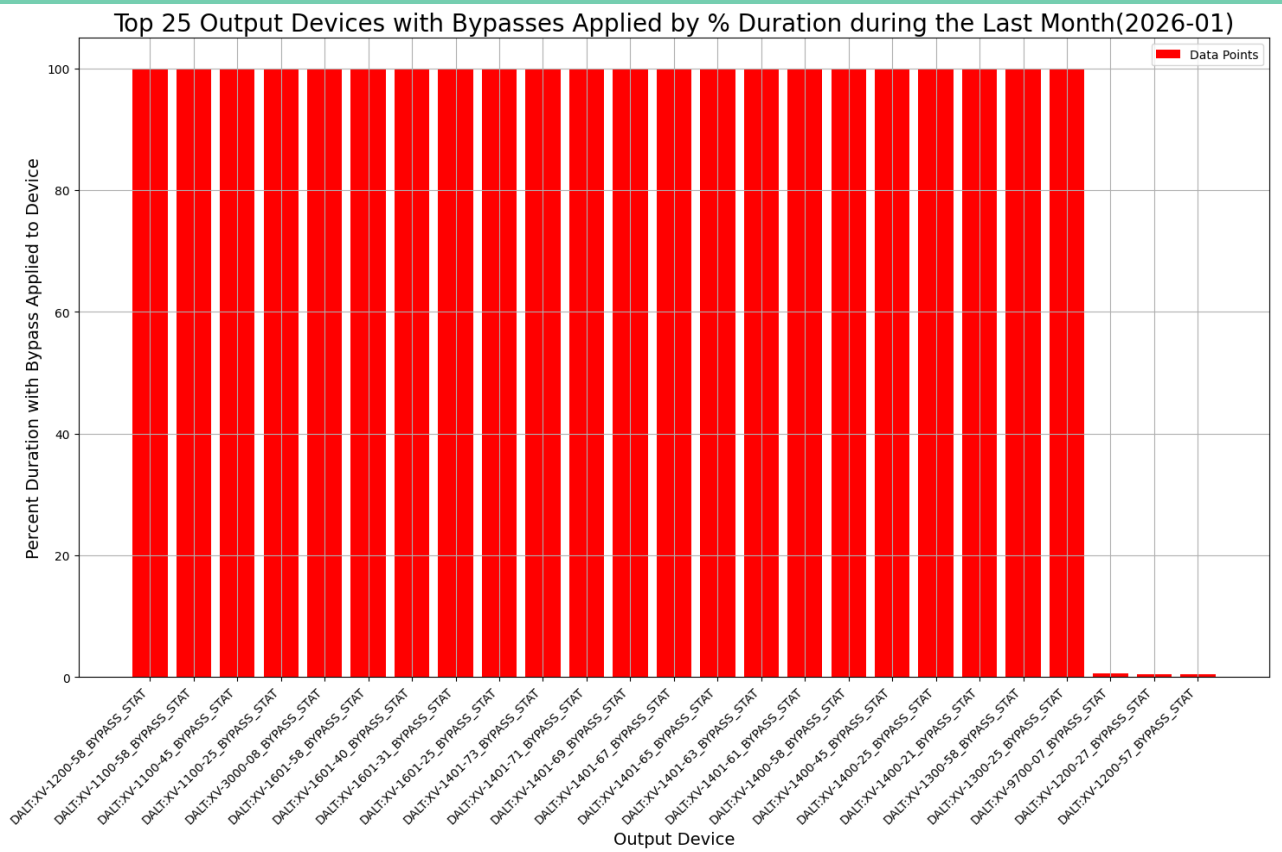
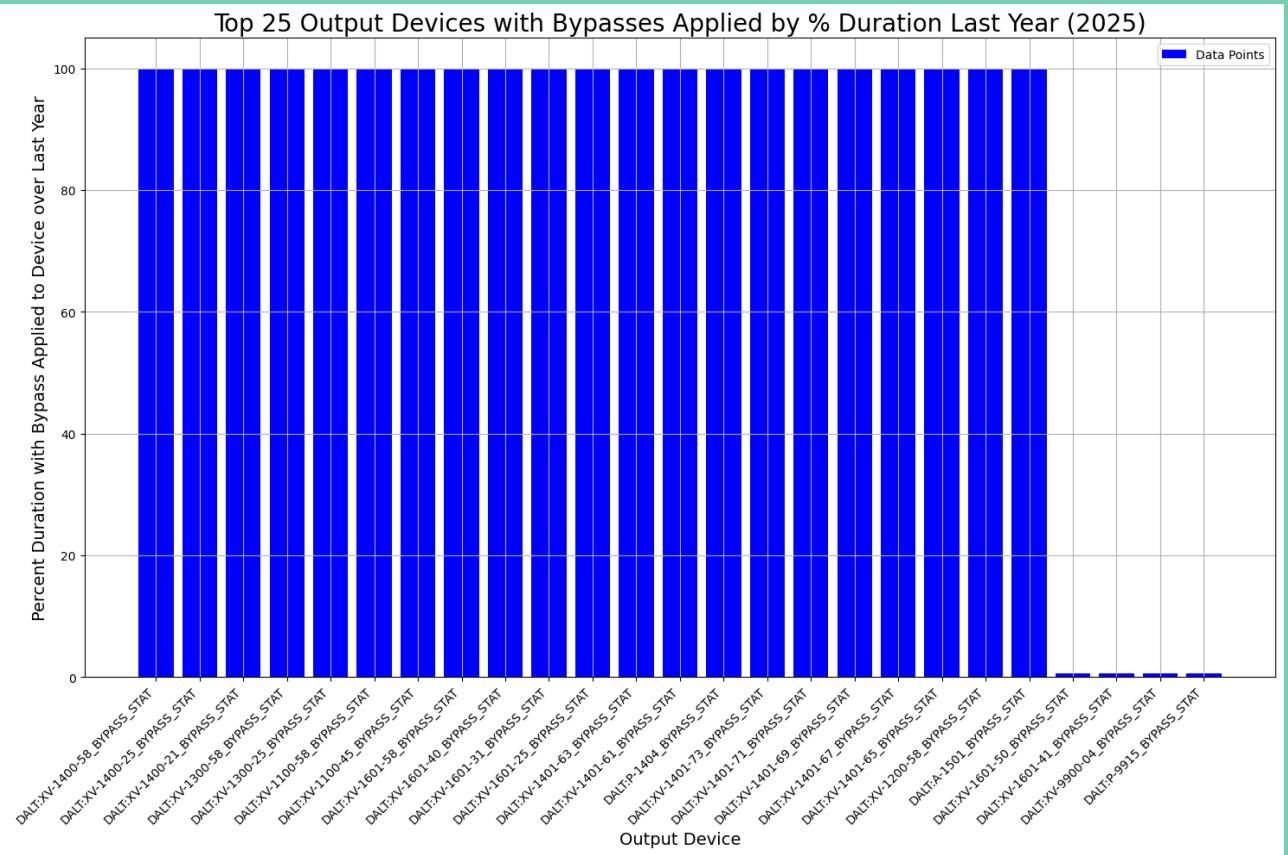
Solution (Pt 4a): Automate the Interlock Bypassed Report Visualization





Output Devices with Interlocks Bypassed January of 2026

Output Devices with Interlocks Bypassed All of 2025

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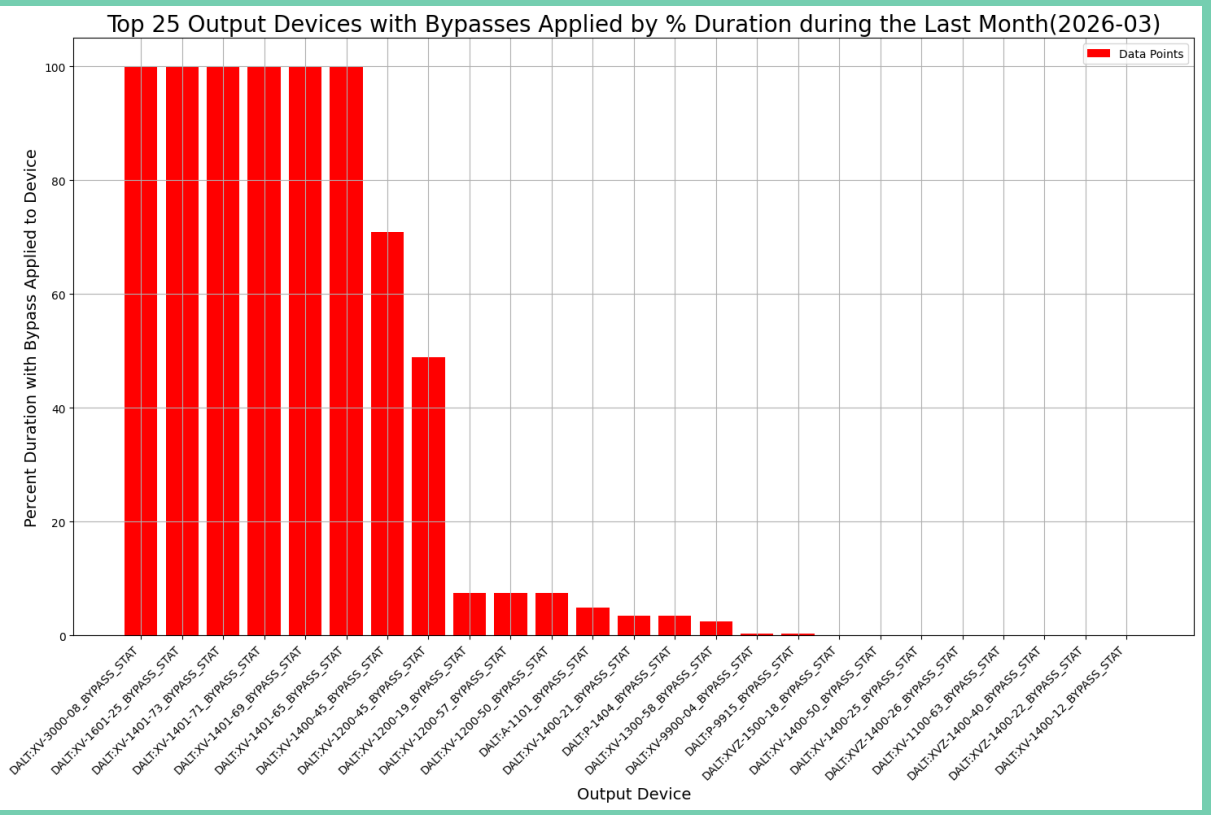
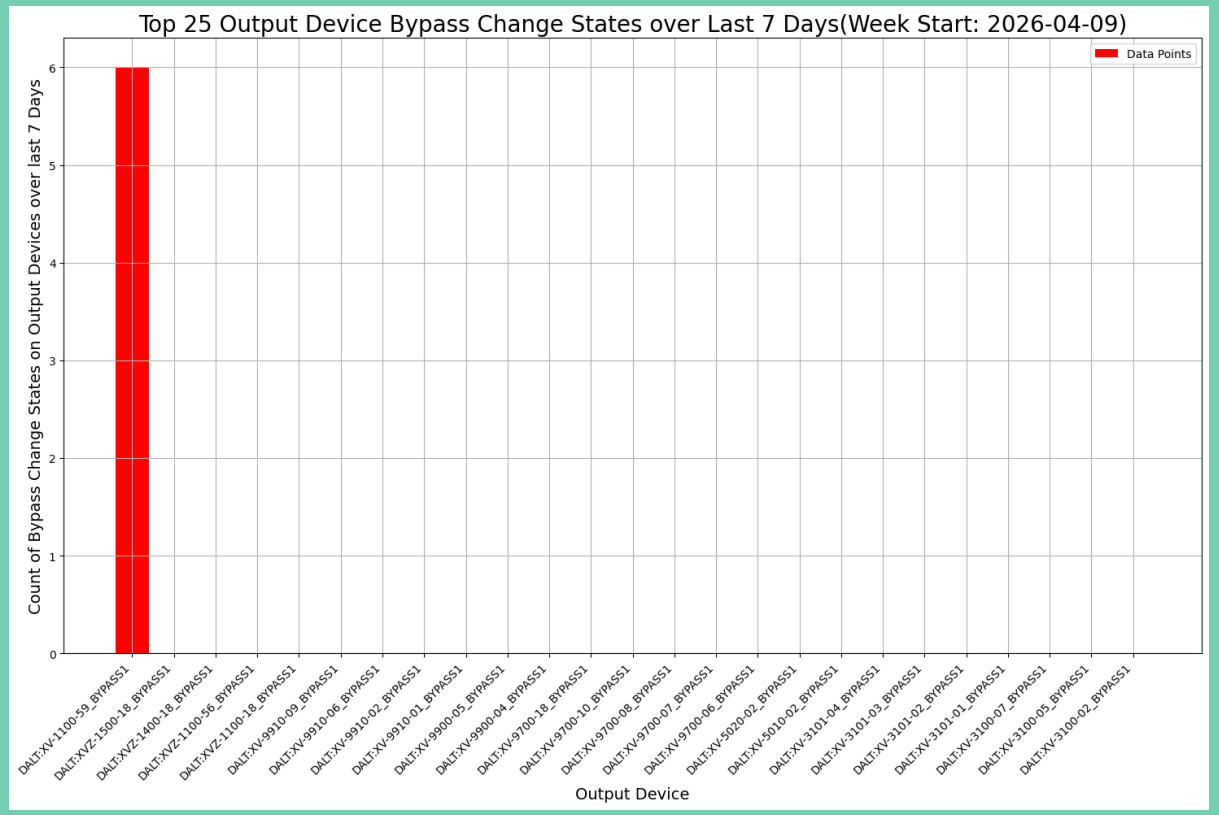
Solution (Pt 4b): Automate the Interlock Bypassed Report Visualization



Report Ran on 4/16/2026



Report Ran on 4/16/2026

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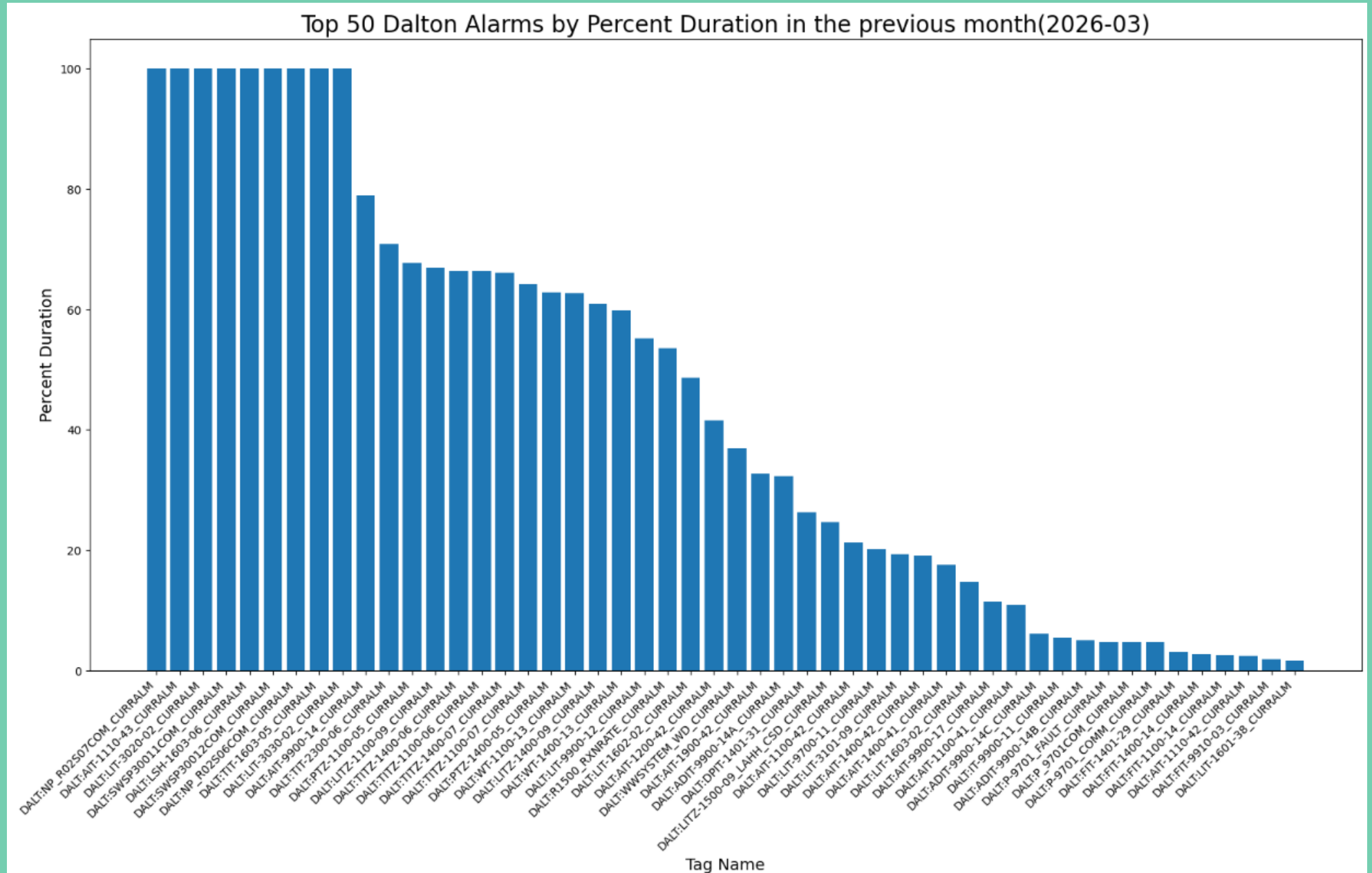
Bonus Solution: Automate Active Alarm Visualization



Summary

Dynamic reporting using Seeq that can also be automatically scheduled and pushed to an Organizer Report.

Re-usable code that can be utilized in more cases than just bypasses applied (alarm rationalization, equipment faults outs, etc.)

Questions?