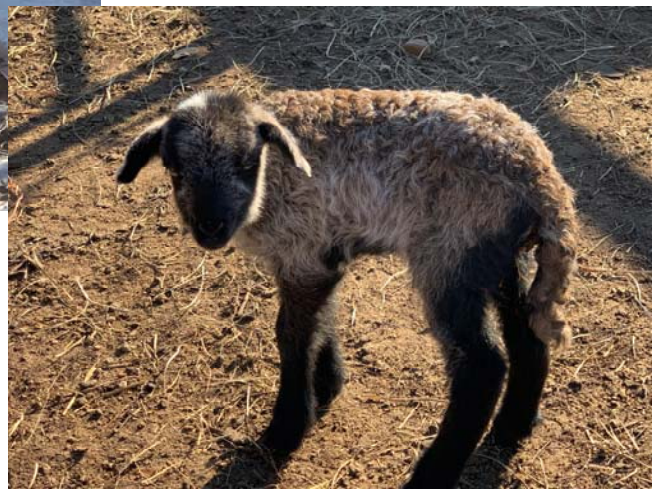
Best Practices When Implementing AF

Presented by: Ales Soudek

Agenda

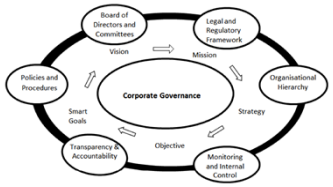
- Things to Keep in Mind
- Organizational Structure
- Governance Framework
- AF Ten Commandments
- Conclusion

First my latest kids



Things to Keep in Mind

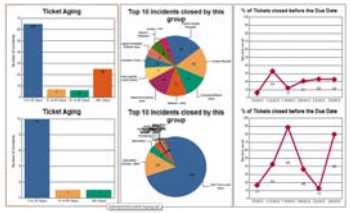
Who will consume data



Governance and Rollout

There is no “Right Way”

Think Big – Start small

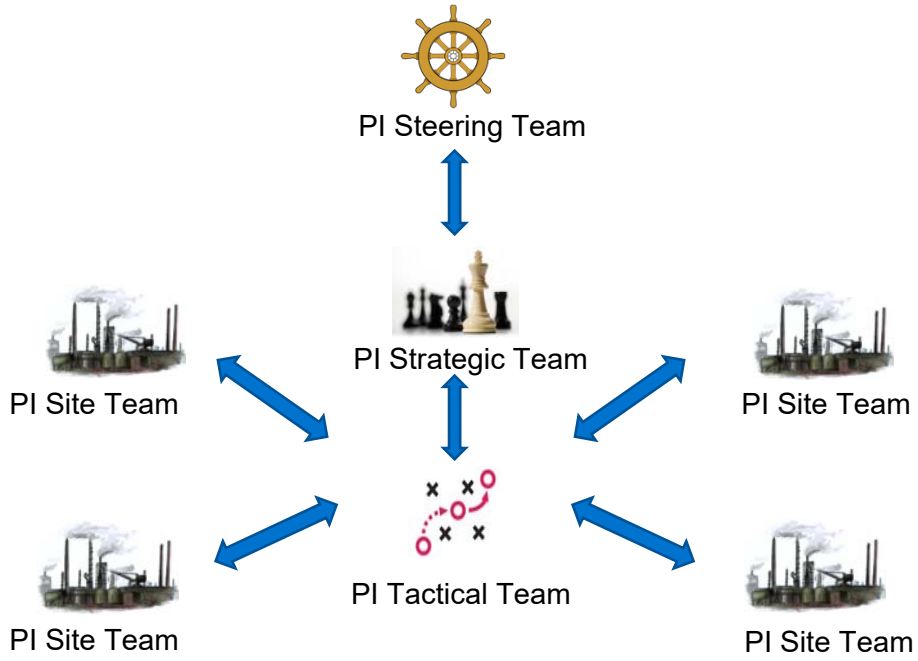


How will it be presented

Roles/Responsibilities

Solve a specific problem

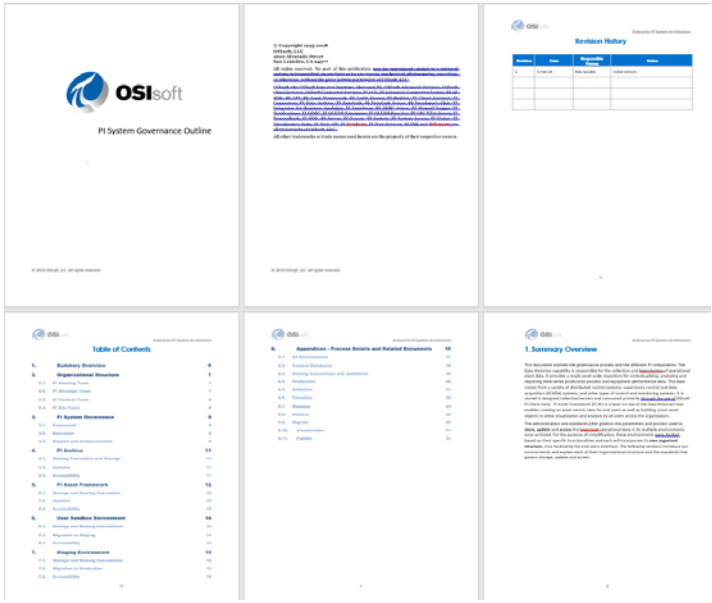
Organizational Structure



- PI Steering Team
  - Vision Setters
- PI Strategic Team
  - Vision into Action
- PI Tactical Team
  - Project Execution
- PI Site Team
  - Supports Project Execution

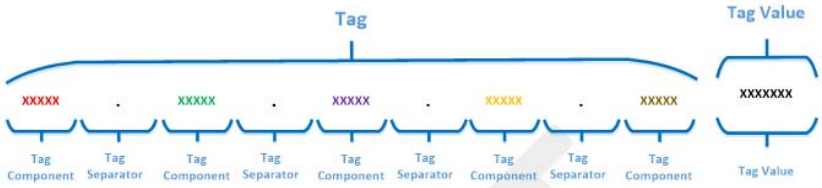
PI System Governance Framework

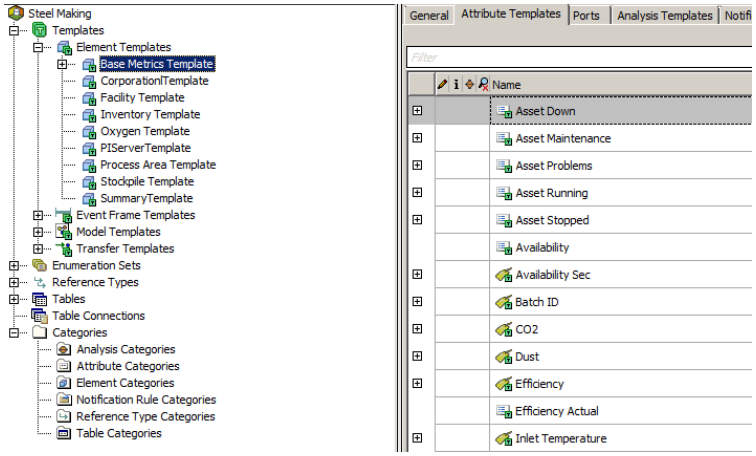
- Governance Outline Doc
  - Update coming this year
- Define Teams
  - Roles and Responsibilities
- Define Rollout Process
  - From Central PI System to Sites
- Change Management Process
  - Approval Process



Governance Framework cont.

- Define Standards
  - Integration to External Systems
  - Naming Conventions (PI Tags, AF Objects)
  - Solution Development
- Define Security and Access
- Standardize PI System Architecture
- Handling Units Of Measure

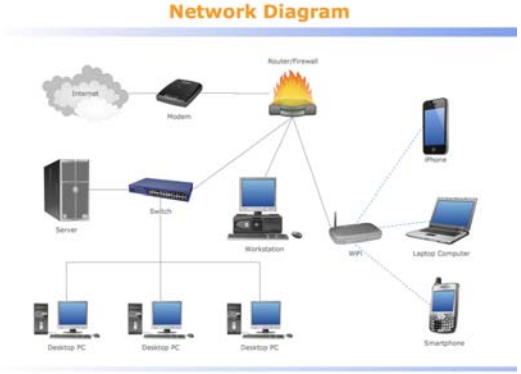


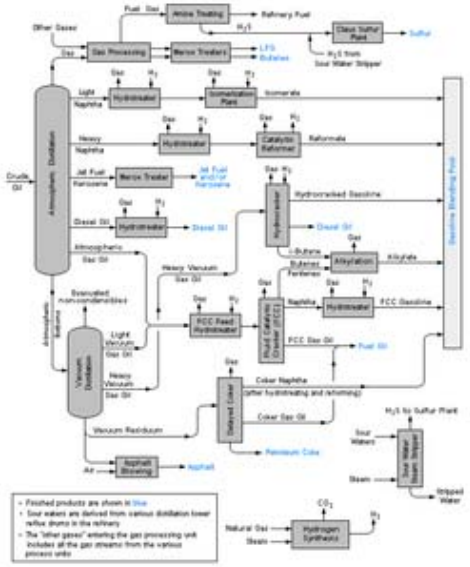


Governance Framework cont.

- Define Documentation Requirements for Projects
  - Scope, AF Model for Project, Deliverables, etc.
- Define Process for Projects
  - Baseline
  - Measure
  - Document Value

IT and OT Roles





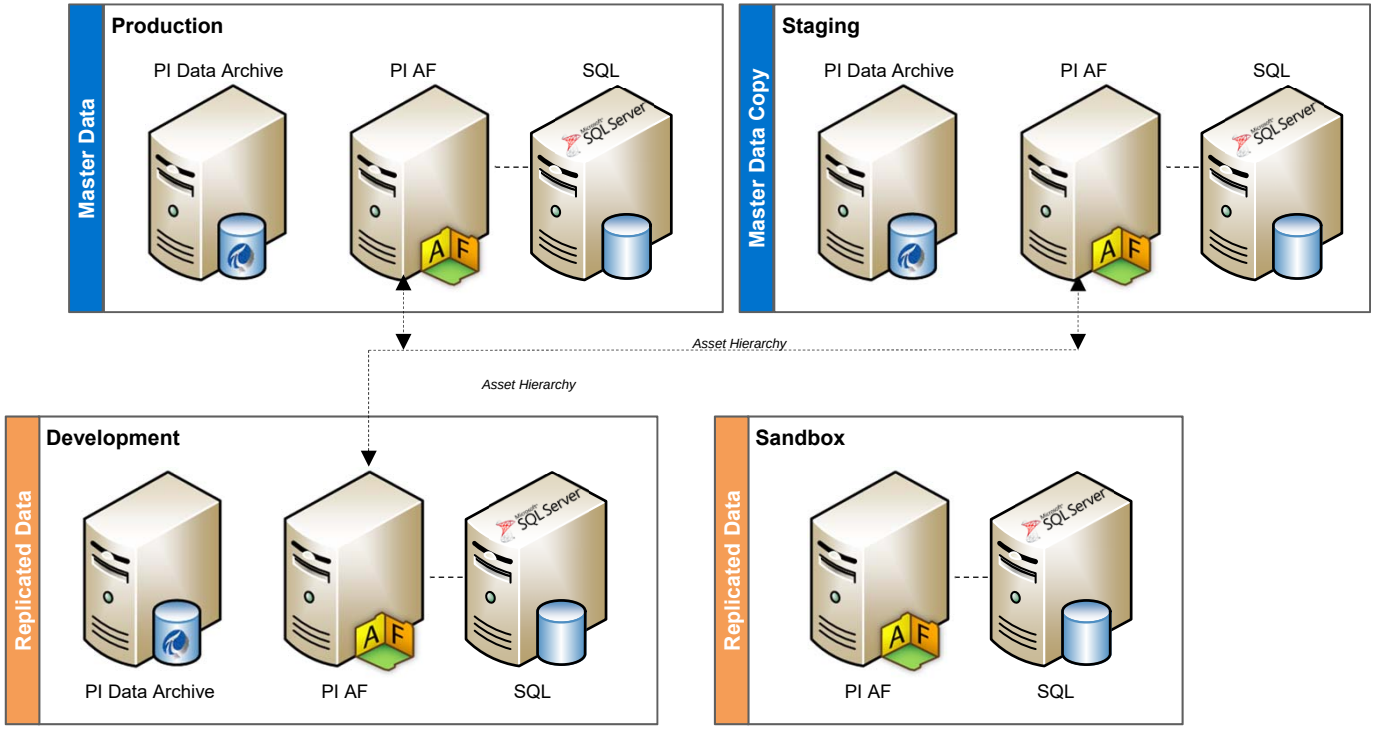
IT - Responsibilities

- Standards
- Security - Monitoring
- Governance Framework
- Template Management
- Roll Out
- Use Cases

OT - Responsibilities

- Standards
- Use Cases
- Hierarchies
- Template Content Management
- Smart Elements

Ideal Architecture



PI Data Archive: Stores time series data, which can be accessed by client tools. This server does not access PI AF Server directly.

PI AF: PI Server component that enables organization of time-series data into logical and/or physical models.

PI AF Database: PI AF database (PIFD) is AF backend stored in SQL Server.

PI System Explorer: PI AF client tool used for AF administration.

Before you start “cooking,” prepare a “recipe”

Choose a **business case** to define:

- **Critical assets**
- **Data sources**
  - Time series
  - Meta data
  - Structure
- **Consumers**
- **Responsibilities** for maintenance
- **Workflow** for changes

Ales' PI AF Commandments

1. Thou shalt use **Templates.**
2. An **Element Hierarchy** shalt follow standards.
3. **Categories** shalt be used everywhere.
4. Different **Views** make life easier.
5. Get to know **PI Builder** – it is your friend.
6. **Defaults** may not your friend.
7. **String Builder** and **Event Frames** are more friends.
8. Thou shalt use **Units of Measure.**
9. Do not only consider **Bottom-Up** approach.
10. Thou shalt build **Smart Elements.**

Thou shalt use **Templates**

Element Classes
- Applies throughout the AF Database
- Elements, attributes, event frames, analyses, notifications, etc.

Master Templates
- Centralized Storage
- Disseminate to Sites

Subject Matter Experts
- Efficiency analysis
- Key Performance Indicators (KPIs)

Can be used to auto-create PI Points
- Ensure PI Point naming consistency

Template inheritance
- Further define relationships between assets
- Start small and grow as needed
- Balance with attribute exclusion

Follow Company Defined Standards
- Naming Conventions
- Derived Templates
- Analytics

An **Element Hierarchy** shalt follow standards

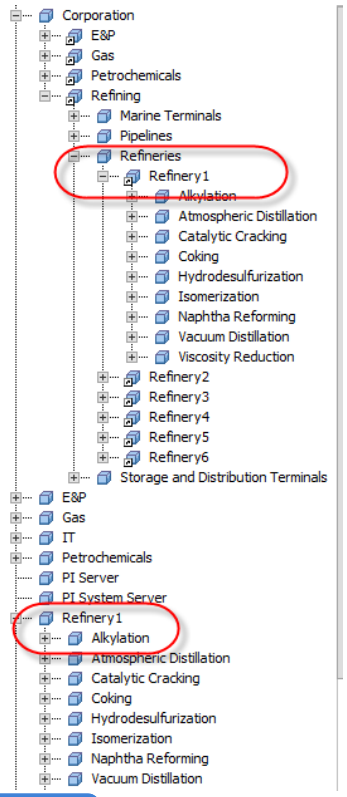
Follow a Standard
- Like S95, etc.
- Keep to Defined Standard

Not SAP hierarchy

Group by Asset Types

Group by Initiative
- Production Reporting
- Operations

Use Weak References for Different Views



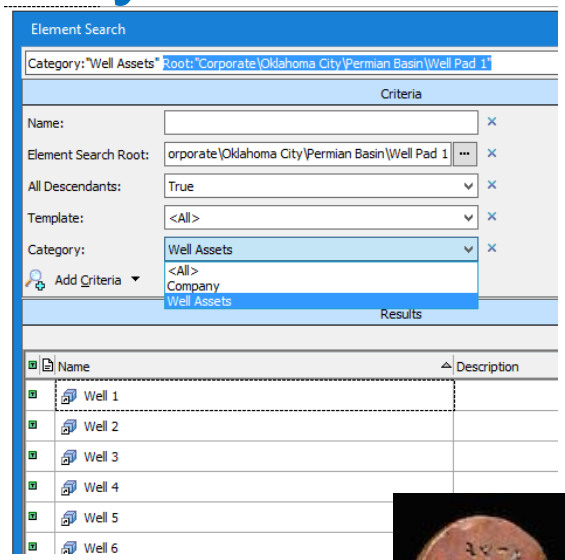
Group by Geography or Business Units

Categories shalt be used everywhere

Organize
- Elements
- Attributes
- Analyses
- Templates
- Tables

Index for Searches

Dimensions for BI Tools



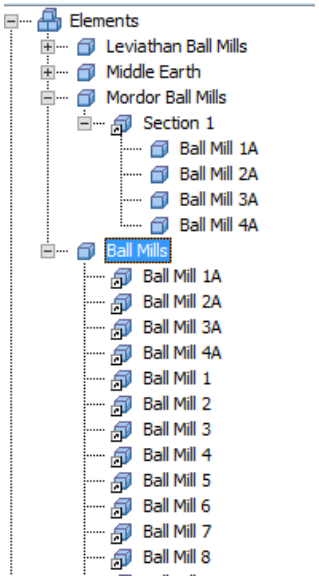
Filter for Reports

More than one Category

Different **Views** make life easier

By Responsibility
- Rollups
- PI Vision

By Function
- Rollups
- PI Vision



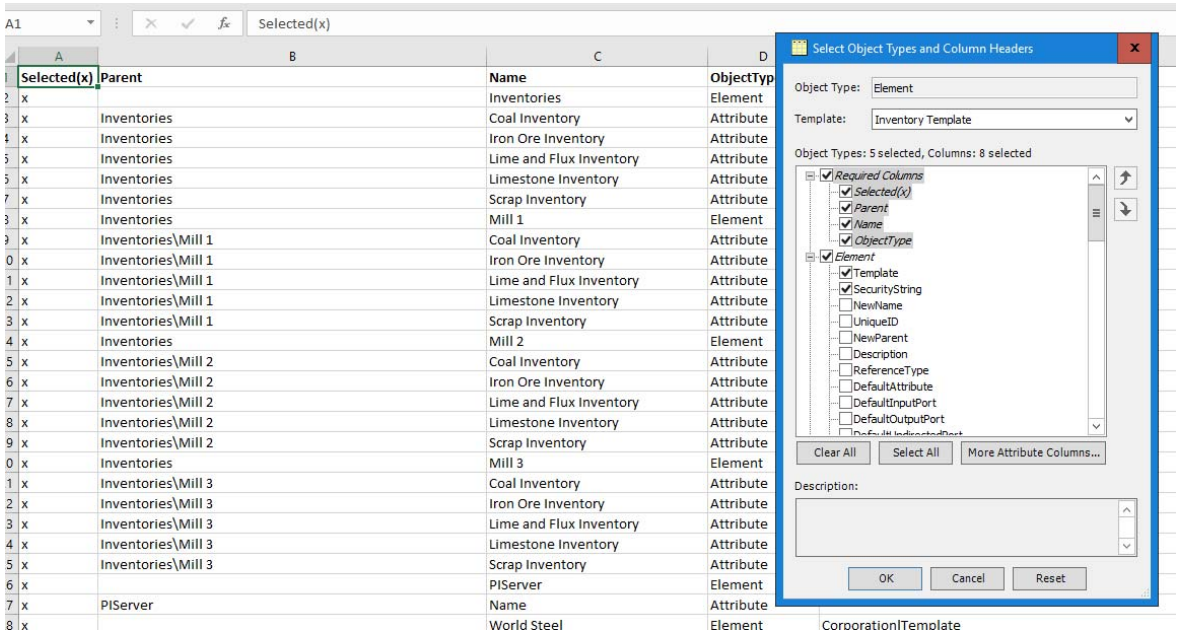
By Asset
- Rollups
- PI Vision

By Reporting
- Rollups
- PI Vision
- BI

PI Builder – it is your friend

Bulk Editing/Creation

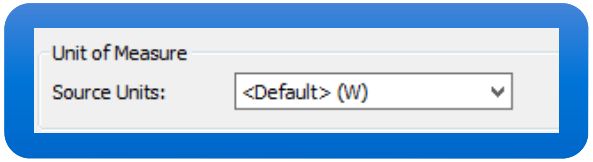
Security Settings for Elements

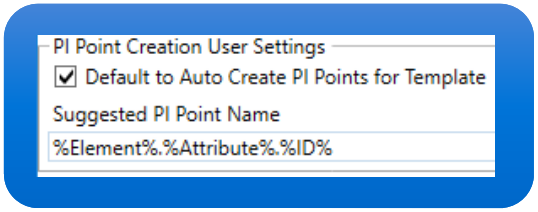


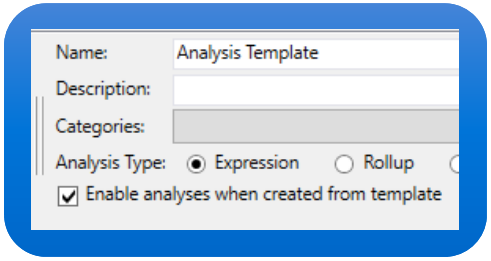
	A	B	C	D
1	Selected(x)	Parent	Name	ObjectTyp
2	x		Inventories	Element
3	x	Inventories	Coal Inventory	Attribute
4	x	Inventories	Iron Ore Inventory	Attribute
5	x	Inventories	Lime and Flux Inventory	Attribute
6	x	Inventories	Limestone Inventory	Attribute
7	x	Inventories	Scrap Inventory	Attribute
8	x	Inventories	Mill 1	Element
9	x	Inventories\Mill 1	Coal Inventory	Attribute
10	x	Inventories\Mill 1	Iron Ore Inventory	Attribute
11	x	Inventories\Mill 1	Lime and Flux Inventory	Attribute
12	x	Inventories\Mill 1	Limestone Inventory	Attribute
13	x	Inventories\Mill 1	Scrap Inventory	Attribute
14	x	Inventories	Mill 2	Element
15	x	Inventories\Mill 2	Coal Inventory	Attribute
16	x	Inventories\Mill 2	Iron Ore Inventory	Attribute
17	x	Inventories\Mill 2	Lime and Flux Inventory	Attribute
18	x	Inventories\Mill 2	Limestone Inventory	Attribute
19	x	Inventories\Mill 2	Scrap Inventory	Attribute
20	x	Inventories	Mill 3	Element
21	x	Inventories\Mill 3	Coal Inventory	Attribute
22	x	Inventories\Mill 3	Iron Ore Inventory	Attribute
23	x	Inventories\Mill 3	Lime and Flux Inventory	Attribute
24	x	Inventories\Mill 3	Limestone Inventory	Attribute
25	x	Inventories\Mill 3	Scrap Inventory	Attribute
26	x		PIServer	Element
27	x	PIServer	Name	Attribute
28	x		World Steel	Element

Backup

Defaults may not your friend

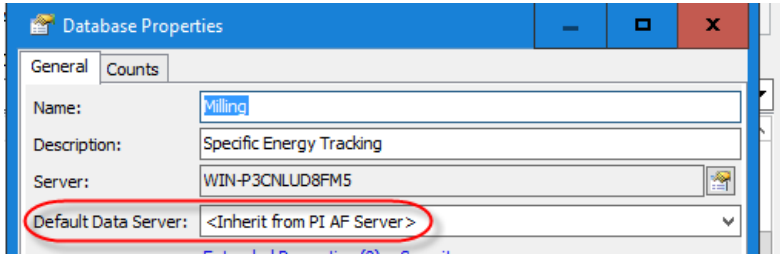






One Exception

%Server% (PI System 2018 SP2 or later)

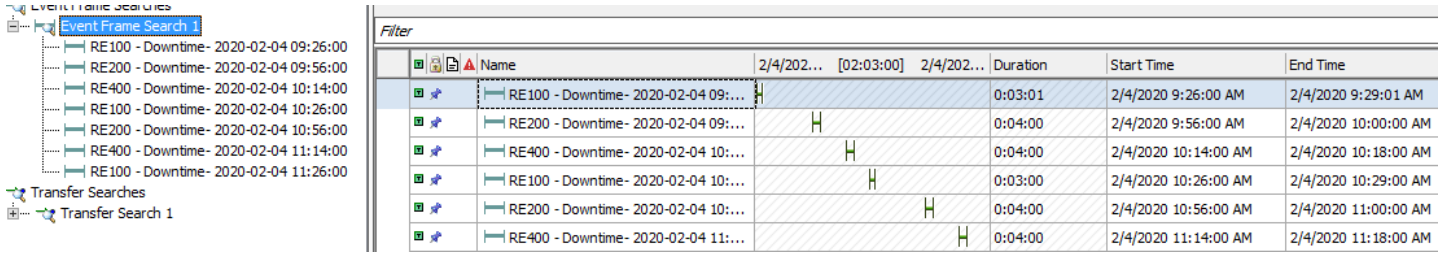


String Builder and Event Frames are more friends

Capture Logic - EFs
- Standardized

Analysis/Navigation - EFs

Calculations - EFs



Not just for text – String Builder

String Builder - EFs
- Get info you can't get otherwise

Thou shalt use **Units of Measure**

Applies to AF Server
- All databases

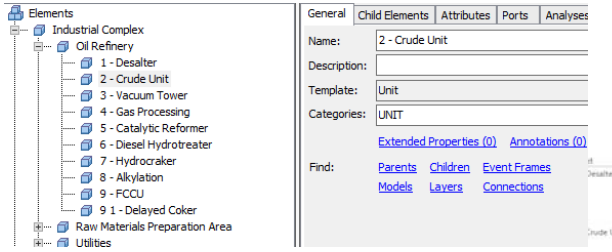
Enforce Consistency

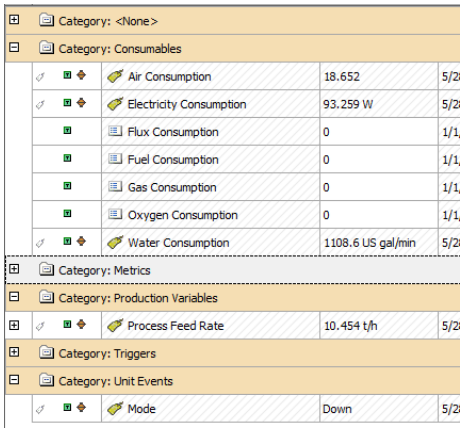
Data Access
- PI Integrators
- PI SQL/OLEDB Enterprise

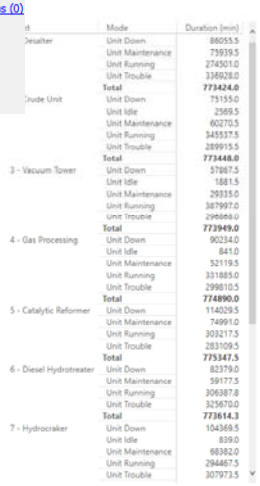
Eliminate Hard-coded factors
- Convert()

Do not only consider **Bottom-Up** approach

Fast Rollout | One Template | Unit Operation | Plant Operation



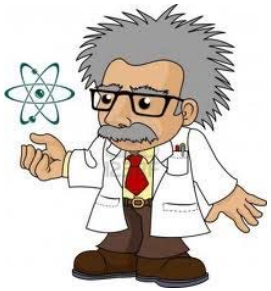




Thou shalt build **Smart Elements**

Analyses
- Efficiency analysis
- Key Performance Indicators (KPIs)

Time-series
- In-Flow
- Pressure
- Vibration data



Events
- Downtime
- Startup
- Failure

Asset details
- Name
- Model
- Manufacturer

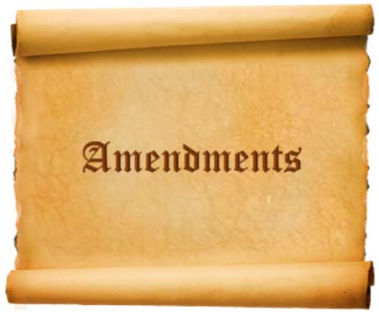
Notifications
- High speed
- Rotor failure
- Low pressure

External data
- Performance curves
- Last maintenance date
- Design documents
- Best operating procedures

Ales' PI AF Commandments - Amendments

Use Distinct Element Names
- Less Confusion (PI Vision)

Use Enumerations
- Minimize mistakes



Use Relative References
- Data References
- Generic
- Less Maintenance

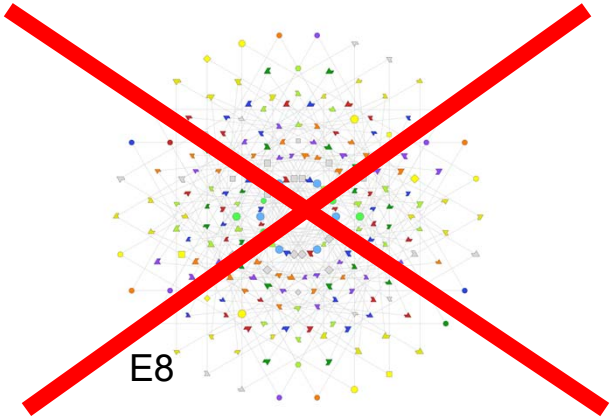
Use AF Tables Carefully
- Use Linked Tables
- Use Parameters

Conclusions

- Organizational Structure and Governance
- Define and Follow Standards
- SMEs Responsibility for Template Content
- Define and Create Rollout Process
- Follow Best Practices

The Takeaways

- Have a plan
- Only model what you understand
- Only invest in resources if you have the use case



Don’t try to boil the ocean or find the theory of everything !

Final Take Away

"A shortcut is the longest distance between two points."

- *Charles Issawi*

Contact Information

Ales Soudek

asoudek@osisoft.com

Global Solutions Group

OSIsoft

Questions?

Please wait for
the **microphone**

State your
name & company

Save the Date...

AMSTERDAM
October 26-29, 2020

OSIsoft. PI World