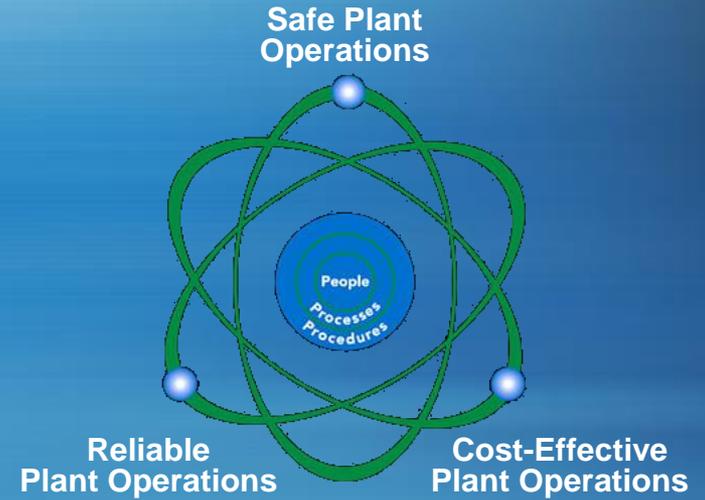


FENOC Vision:

PEOPLE with a strong safety and environmental focus providing value to our customers by delivering top fleet operating performance.



FENOC

FirstEnergy Nuclear Operating Company

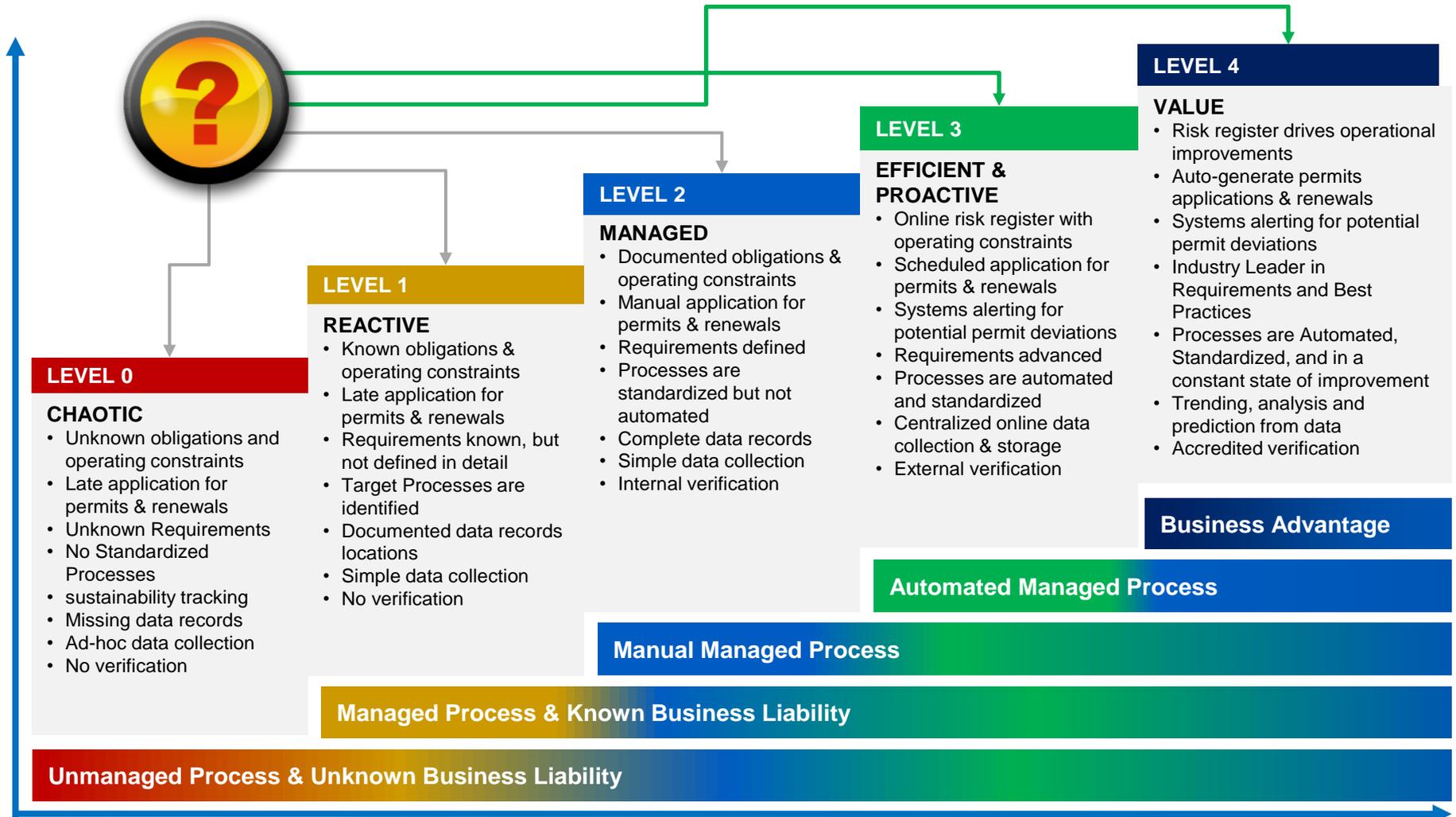


**Improving Outage Performance
Through Streamlined Information Delivery**
Tom Raymond, *Senior Consultant FirstEnergy Fleet Outages*
January 29, 2015

Improving Outage Performance Through Streamlined Information Delivery



Capabilities Maturity Model



Problem Statement: The GAP

Our Story: We recognized a need for timely, consistent and accurate outage information delivery and performance indicators across the entire fleet.

Issues confronted:

- Limited resources to gather data and publish daily schedules, work down curves, histograms, etc.
- 3 different nuclear sites, more than 3 different approaches to monitor outage progress and manage the outcome
- Schedule 'credibility' was lost
- Ability to consistently and accurately monitor outage performance was lost



Pre-state Diagram

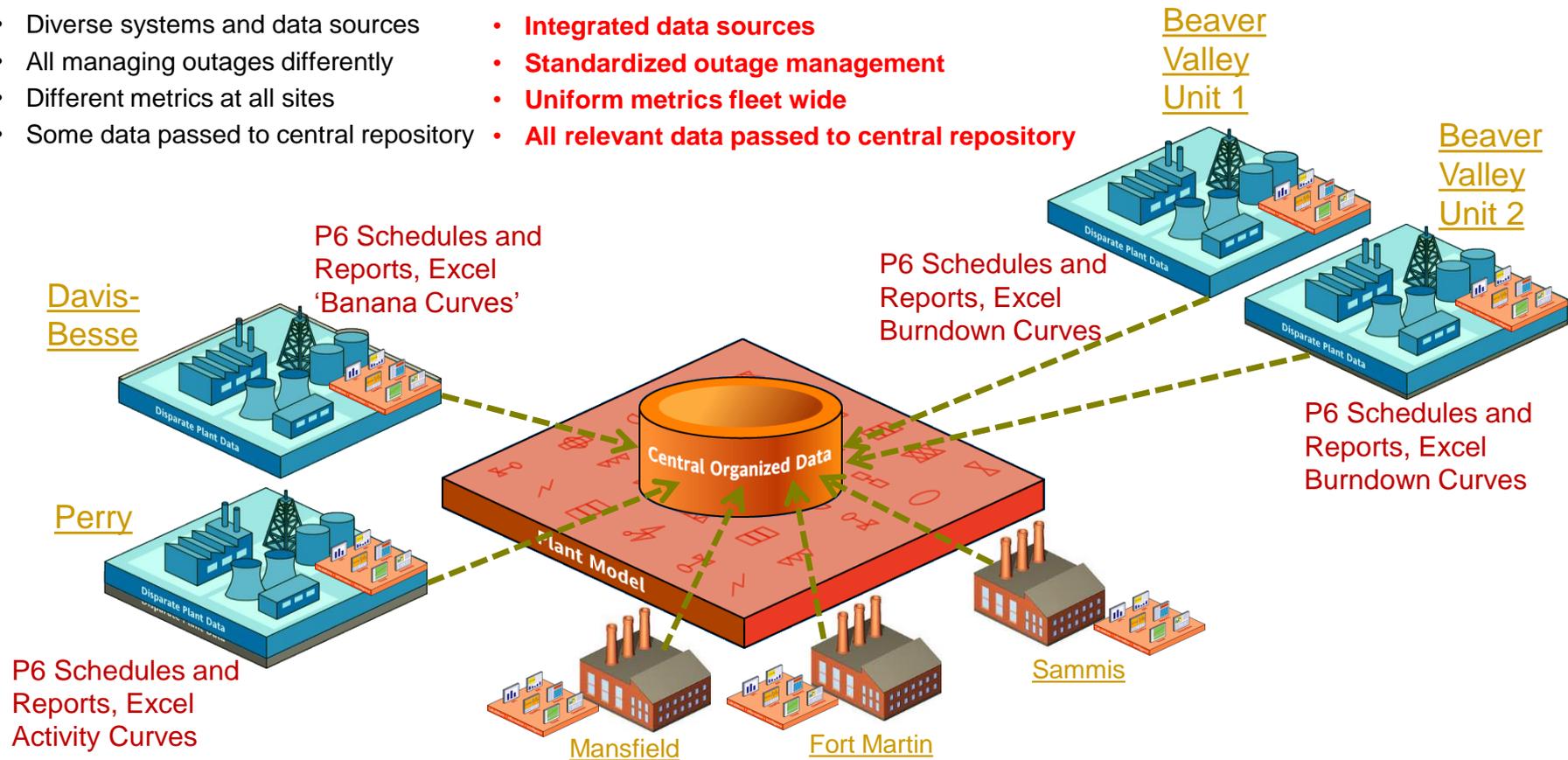
Plants operating independently and manually

Issues Identified

- Diverse systems and data sources
- All managing outages differently
- Different metrics at all sites
- Some data passed to central repository

Goals

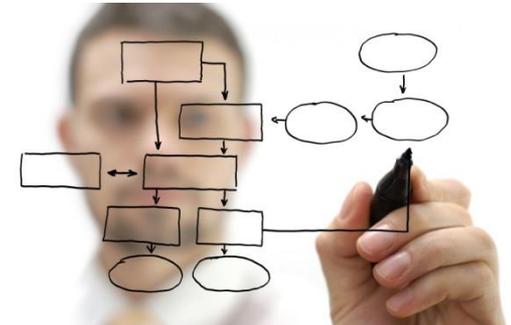
- **Integrated data sources**
- **Standardized outage management**
- **Uniform metrics fleet wide**
- **All relevant data passed to central repository**



Plan of Action

■ First Step: The Project Plan to address gap

- Assembled a Team of technical experts and end-users from Business and IT to clearly define the problem and brainstorm potential solutions. The Team Sponsor challenged the team members to look 'outside the box' to come up with the most cost-effective solution for the fleet.
- Considered other information delivery tools, including Primavera P6, Crystal Reports, BI Publisher, Oracle P6 Analytics, and QlikView.



■ Evaluated potential solutions

- Conducted cost/benefit analysis
- Knowledge Relay worked closely with FENOC to develop a comprehensive 'Statement of Work' and implementation schedule



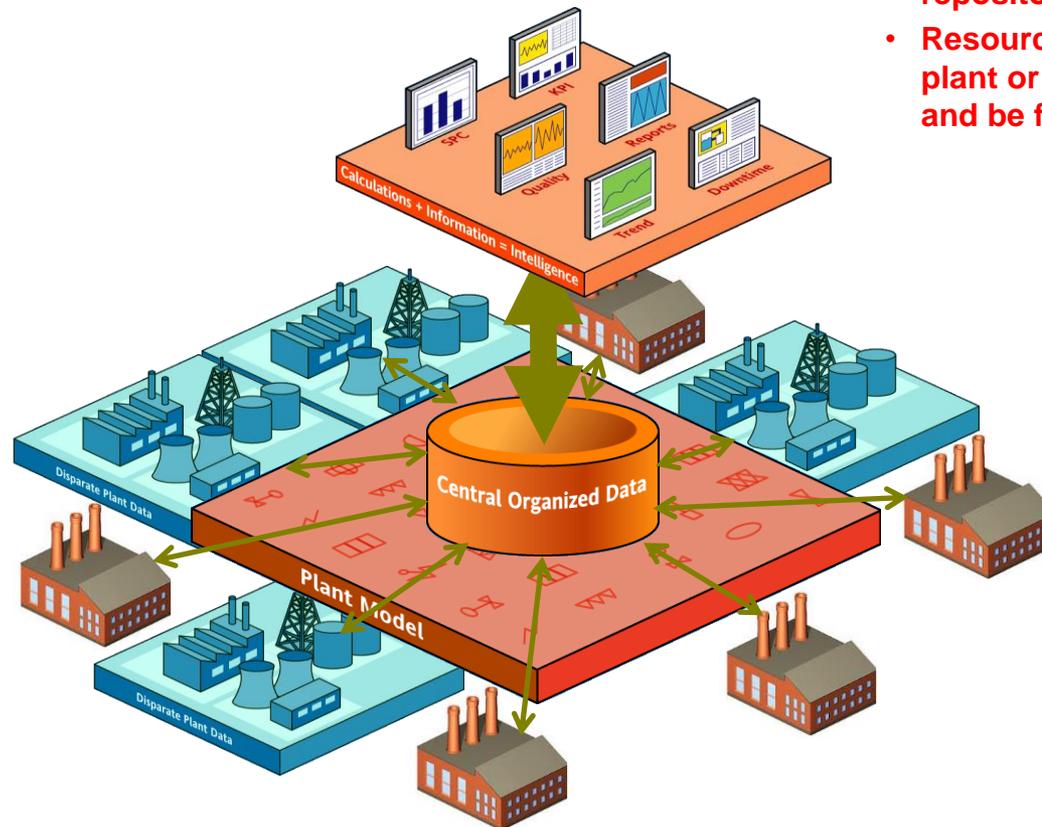
The Solution

- Select vendor
 - Domain expertise
 - 🔑 Proven, deployed architecture
 - They must be able to prove that they've done it before
- Get I.T. and management “buy-in” and commitment throughout the project
- Provide Proper Training
 - IT professionals
 - Report “writers” and “runners”
 - Consumers
- Co-develop Key Reports with vendor, including daily performance summary, activities burn down curves and man hours burn down curves
- Implement Change Management plan to ‘educate’ end-users, managers and leadership team and promote “evolution” of solutions



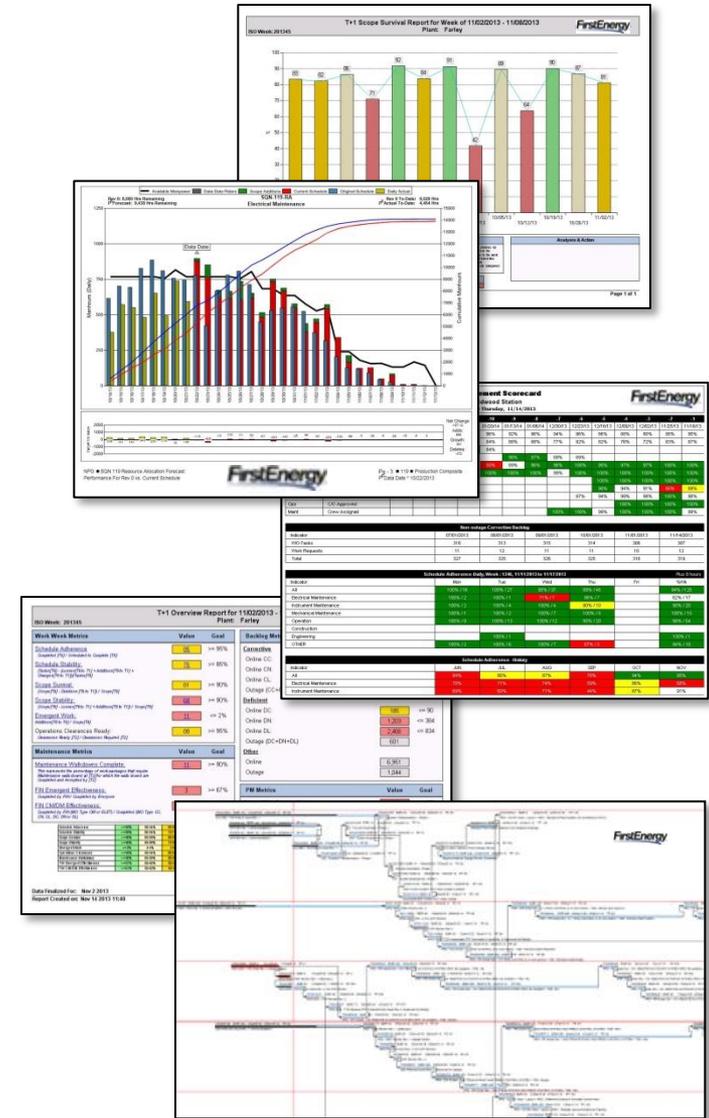
End-state Diagram

- **Integrated data sources**
- **Standardized outage management**
- **Uniform metrics fleet wide**
- **All relevant data passed to central repository**
- **Resources can go from plant to plant or from outage to outage and be familiar with metrics.**

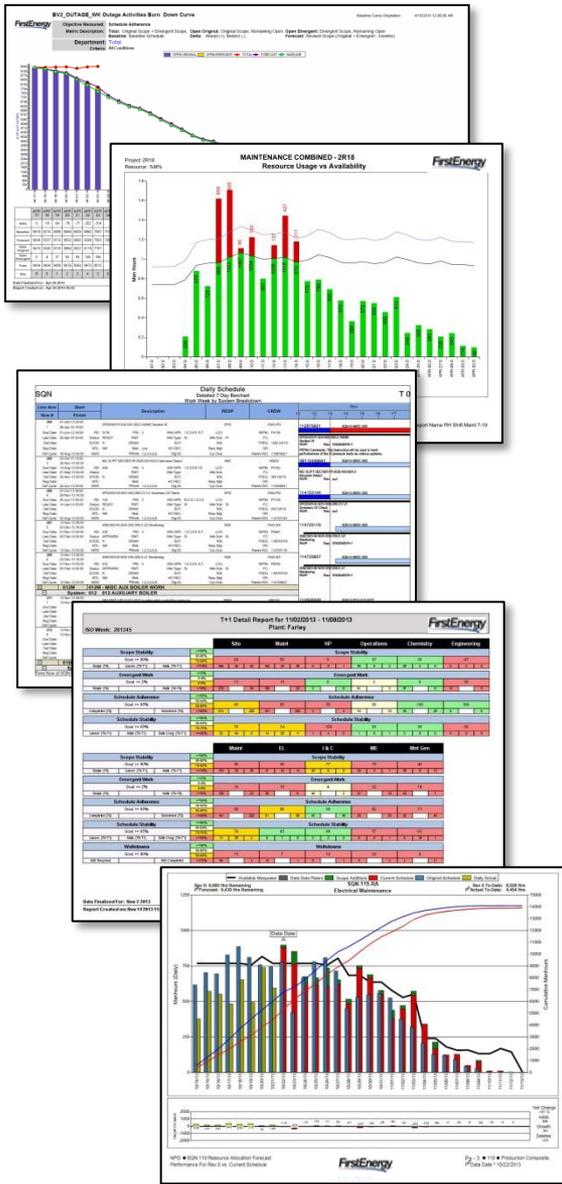


Results

- **Outage reports and performance indicators are identical** across the FENOC fleet
- Resource sharing benefits (**no learning curve** since managers, superintendents, supervisors, craft have seen this tool at their home station)
- **Data movement is automated, standardized, cleansed and staged** for “snapshot” use.
- **Automated** critical path **reports**, shop reports, project reports are standardized, consistent and accurate

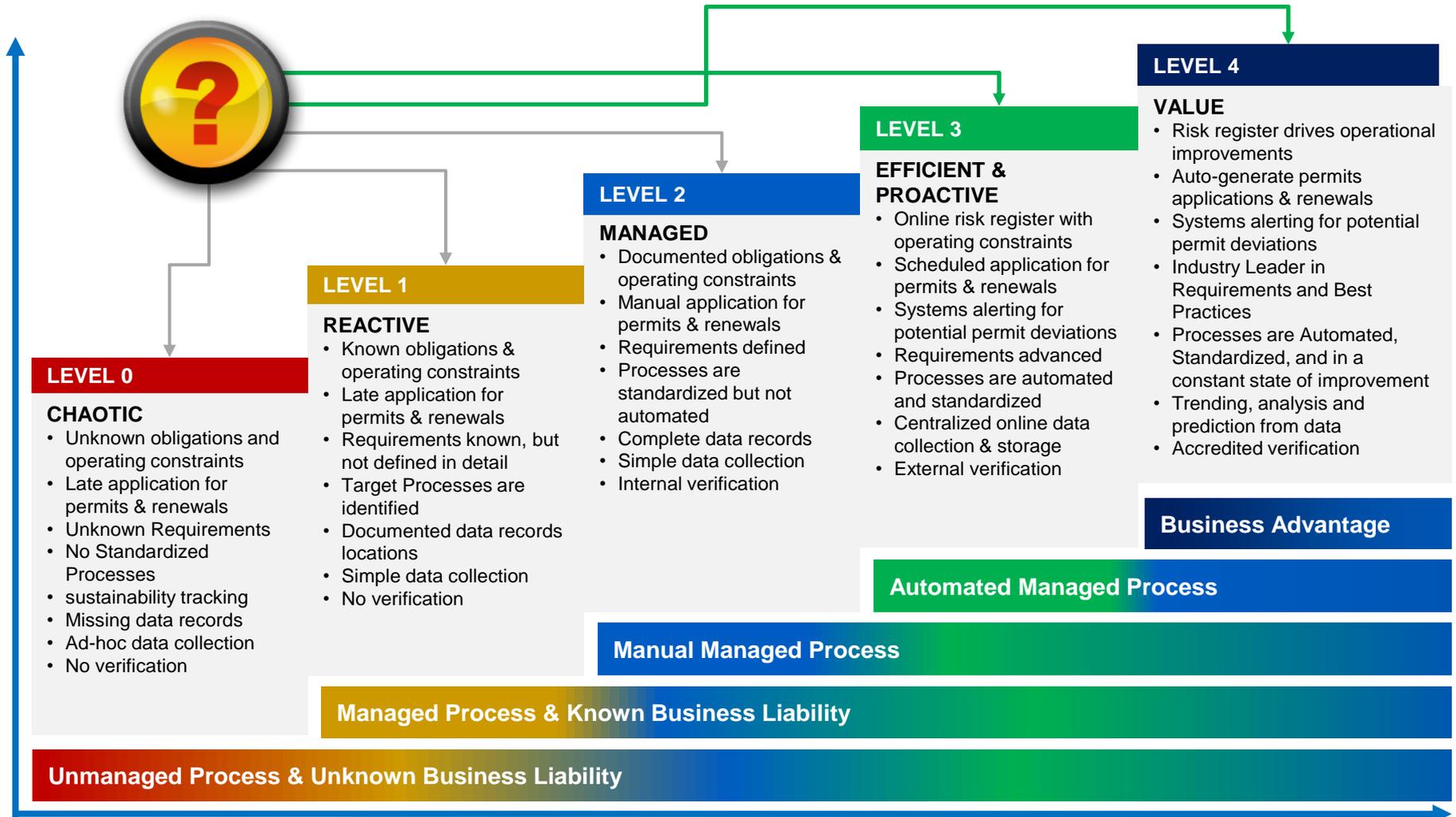


Results



- More **efficient resource utilization**
 - **Automated reports and performance indicators** allow site DBA or lead scheduler to focus attention on schedule quality and accuracy (**saving at least 6 man-hours per outage day**)
- Automated manpower resource histograms will be in place for Spring 2015 outages
- Schedule ‘credibility’ has improved
- **Reduced outage costs** through improved ‘Schedule Accountability’ (performance indicators have become useful tools to monitor schedule performance, direct management attention and resources where needed)

Capabilities Maturity Model: Where are you?



Results (ROI)

Operators that Adopted Operational Excellence Realized Results

- * Planned Outages every 1.5 Years Per Unit
- * Revenue Lost Per Day During Outage = \$1,000,000

Cumulative Revenue Gains			
	Year 1	Year 2	Year 3
Unit 1	\$ 4,133,333	\$ 8,266,667	\$ 12,400,000
Unit 2	\$ 4,133,333	\$ 8,266,667	\$ 12,400,000
Unit 3	\$ 4,133,333	\$ 8,266,667	\$ 12,400,000
Unit 4	\$ 4,133,333	\$ 8,266,667	\$ 12,400,000
Sum Totals	\$ 16,533,333	\$ 33,066,667	\$ 49,600,000

Estimated (3-yr.) Gain: \$49,600,000

Avg. Annual Outage	Days / Unit/ Year
North America	35.6
Operational Excellence Adopters	29.4

NRC numbers from 2000 - 2009

- * Save on Average 6.2 Days Per Outage
- * Revenue Saved Per Outage = \$6,200,000
- * Savings Per Year / Per Unit = \$4,133,333

???

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