VIPs: WHO ARE THEY AND WHAT CAN THEY DO FOR US?

Robert A. Nissen
Jacobs
Houston, Texas

Northwest Construction Consumer Council Conference
Bellingham, WA
February 26, 2003

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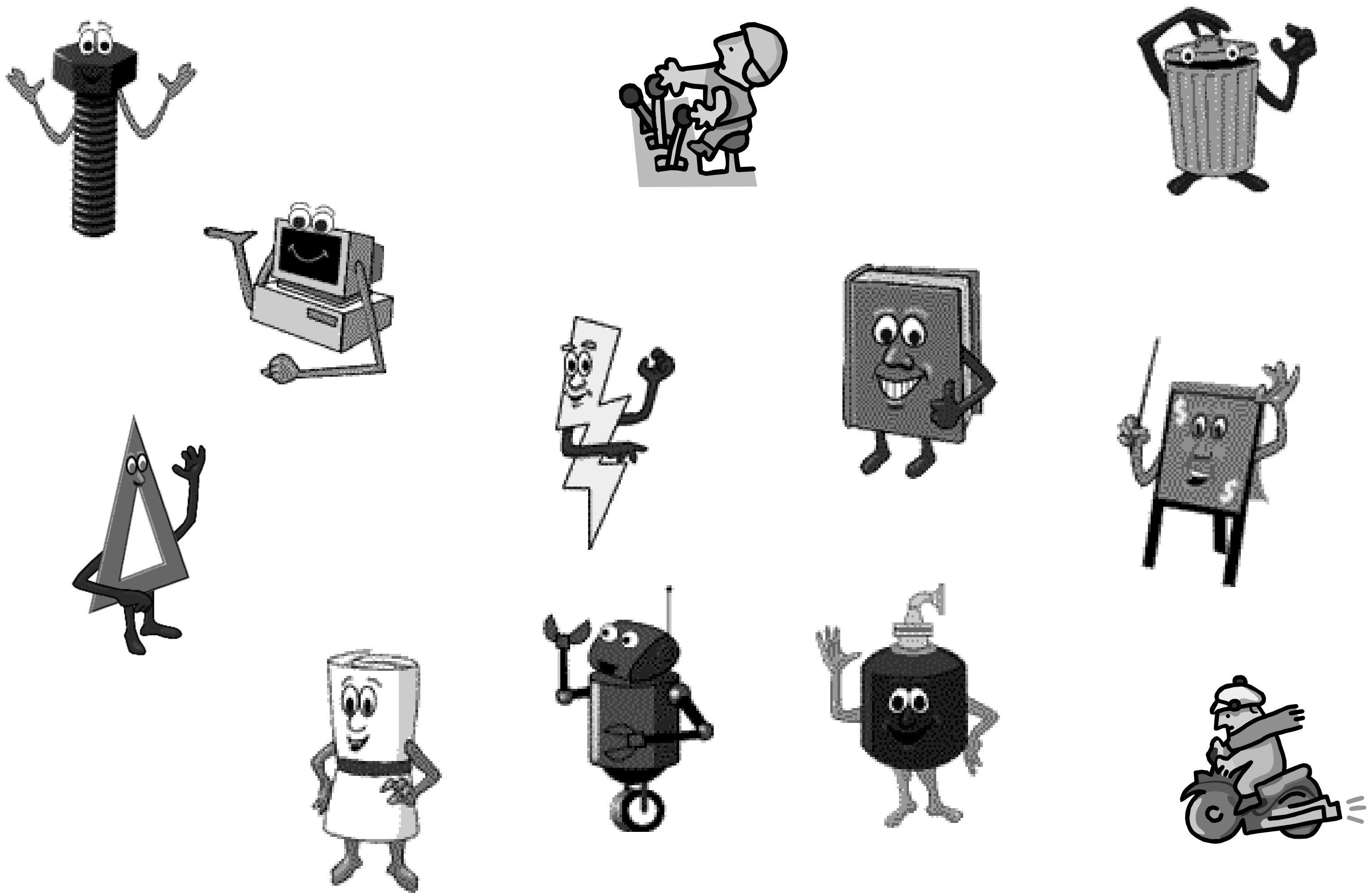
Who Are These Characters?



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Don’t Be Afraid of Them………

They Can Help You Significantly Increase the Chances of Having a Successful Project Outcome!

Project Critical Success Factors

- Integrated Aligned Team
  - Business, Operations, Maintenance, Engineering, Projects
- Common Work Process
  - Best in Class FEL
  - **Best Practices/VIPs**
- Project Metrics
  - Safety, Cost, Schedule, Operability
  - FEL – IPA or PDRI, %VIPs
  - Value Creation
- Disciplined Implementation of Change Management

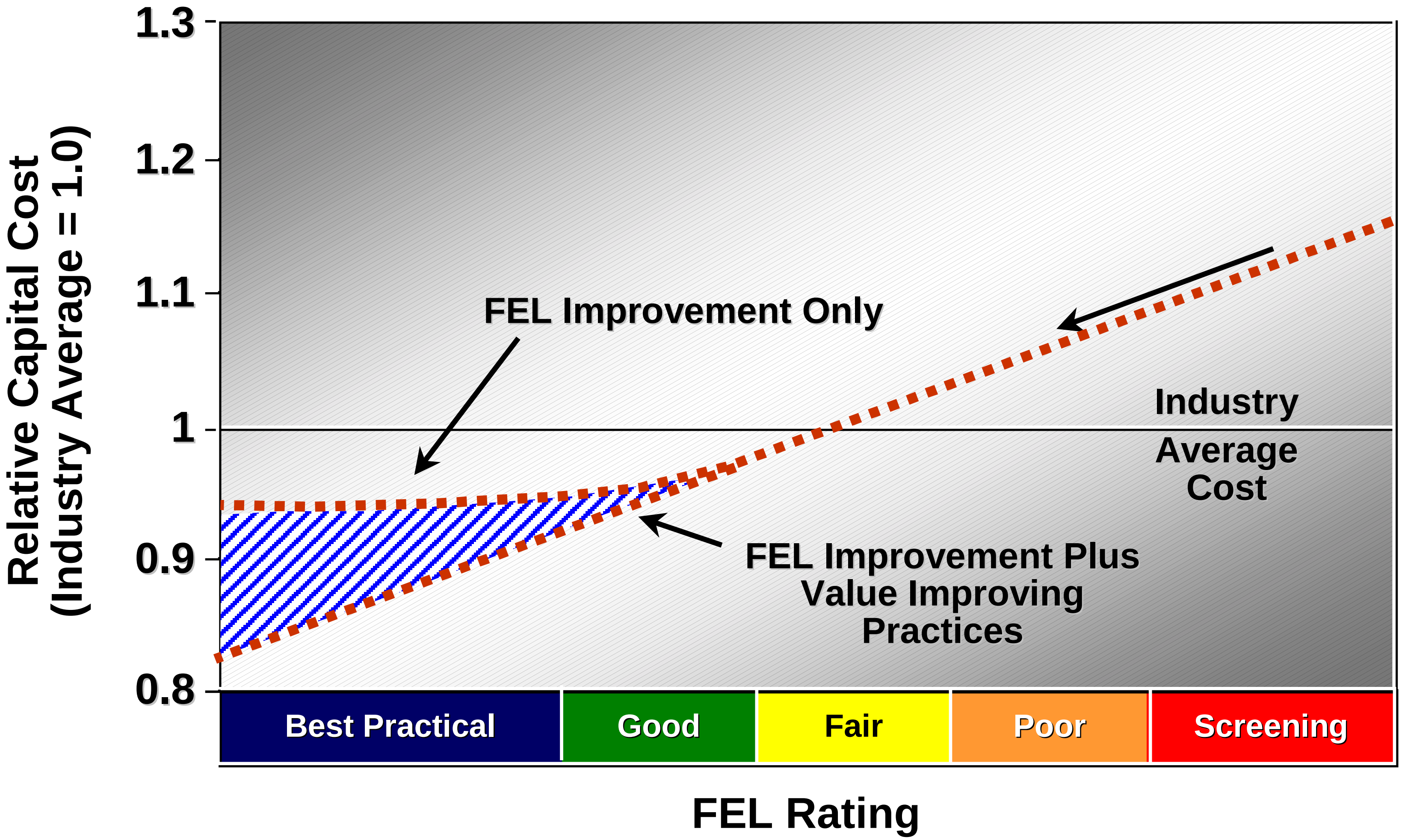
Value Improving Practices/VIPs

Definition

The Value Improving Practices (VIPs) described in this presentation are out-of-the ordinary practices used to improve cost, schedule, and / or reliability of capital construction projects.

VIPs are not business-as-usual. In all cases, a distinct and definable work process must be followed; the practice must be applied to the entire project scope (not just a special look at some aspect of project); and, the documentation required to make use of the results must be produced. Each VIP is used during the project definition (FEL) phase, although the use of 3D CAD and constructability carries into the execution phase.

FEL Plus VIPs Enable Better Cost Performance



Source: IPA

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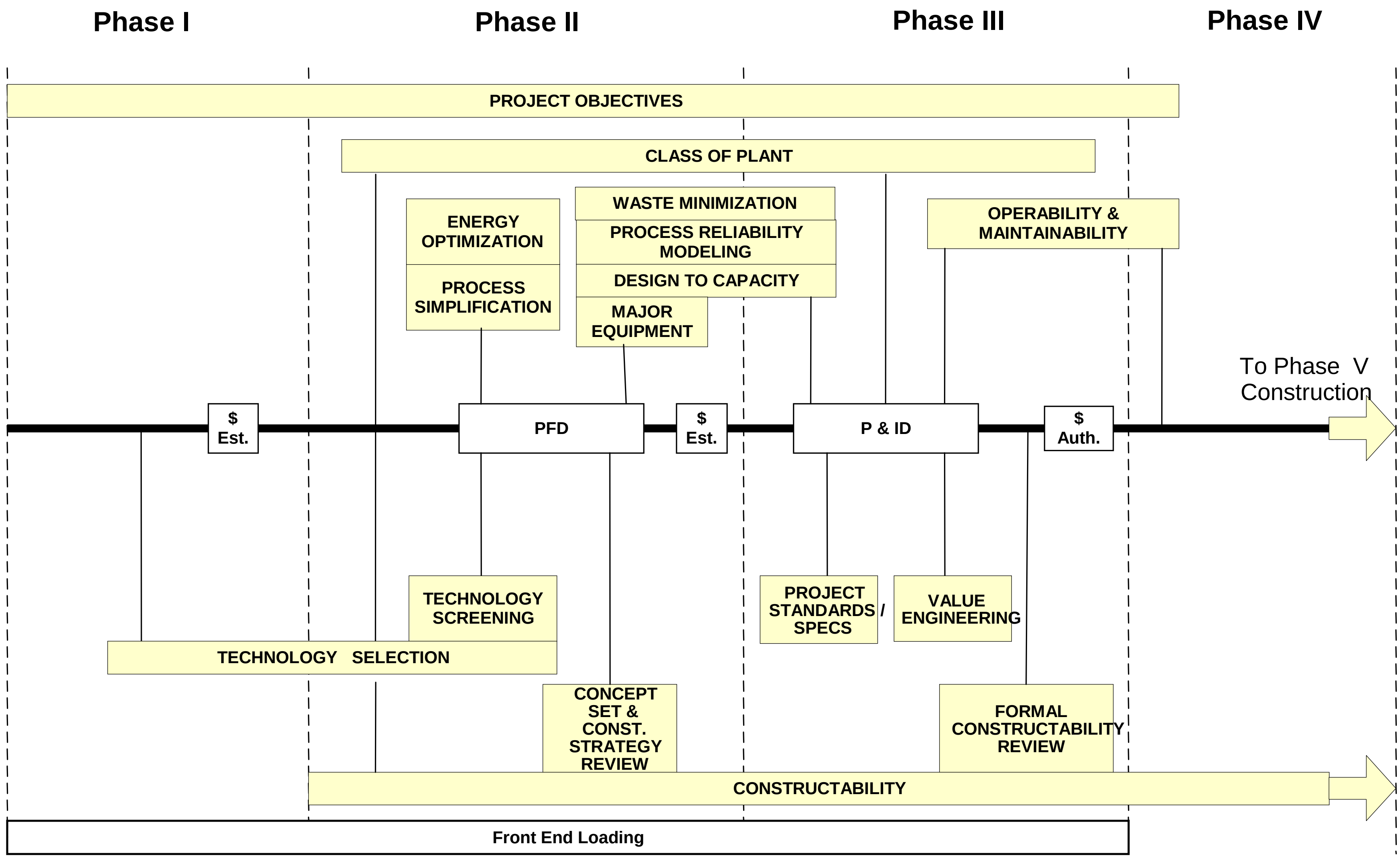
Usage Of VIPs

- Currently the Industry Average of VIP usage (among Benchmarked companies) is 32%
- Recommended usage range is between 30 and 60%.
- Best Practical usage range is between 40 and 60%.
- There is some overlap in VIPs, so 100% usage is not recommended.

VIP Application Timeframe



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IPA Value-Improving Practices

- Process Simplification
- Technology Selection
- Traditional Value Engineering
- Minimizing Standards & Specifications
- Design-to-Capacity
- Classes of Plant Quality
- Process Reliability Modeling
- Constructability Reviews
- Predictive Maintenance
- Waste Minimization
- Energy Optimization
- Integrated CAE

Value Improving Practices/VIPs

- "Outside the Team" Experienced Facilitator Benefits
  - Produce maximum value added (not "checking the box")
  - Lessons Learned from previous workshops
  - All team members can participate
  - Benchmarking "credit"
  - Consistent methodology

VIP Selection

1	2	3	4	5	6
	<u>VIP Name</u>	**Is VIP Applicable (In Scope)?** ☑ for Yes *(If Yes, continue to next Column)*	Importance of VIP to Meeting Project Objectives (Realize Value)	Risk of Successful VIP Execution	Planned VIP to be Used ☑ for Yes
	**Setting Business Priorities/ *Classes of Plant Quality***		**Low Med High**	**Low Med High**	
	**Technology Selection**		**Low Med High**	**Low Med High**	
	**Constructability**		**Low Med High**	**Low Med High**	
	**Traditional Value Engineering**		**Low Med High**	**Low Med High**	

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Selected VIP Definitions and Objectives

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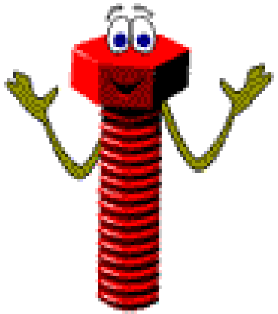
Constructability

Definition

Analysis of the design, usually performed by experienced construction managers, to reduce costs or save time in the construction phase.



Constructability

Objectives

- Reduce Total Installed Costs
- Reduce Schedule Durations
- Develop Construction Driven Schedules
- Ensure the Project is Fundamentally Constructable
- Develop an ongoing “log” for tracking ideas

Design to Capacity

Definition

An evaluation of the maximum capacity of each major piece of equipment. Often equipment is designed with a “safety factor” to allow for additional catch up capacity of some production increases.

Design to Capacity

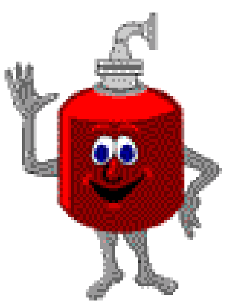
<u>Objectives</u>

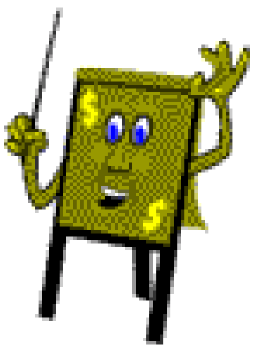
- **Maximize the project NPV.**
- **Identify and set basis for capacity decisions/design allowances that align with Sponsor's objectives.**
- **Clarify the impact of capacity decisions of major equipment on the capacity of the overall facility and future expandability.**
- **Provide clear communication and alignment of capacity decisions to the Business Sponsors and Project Team Members.**

Value Engineering
Process Simplification

Definition

A disciplined method used during design, often involving the use of an internal or external VE consultant, aimed at eliminating or modifying items that do not contribute to meeting business needs.





Value Engineering
Process Simplification

Objectives

- Confirm the value of selected components of a project.
- Improve the economics of the project by elimination of, reduction, or substitution of these components with lower cost alternatives that perform needed functions.
- Increase the project teams understanding of the functional requirements of critical system components.

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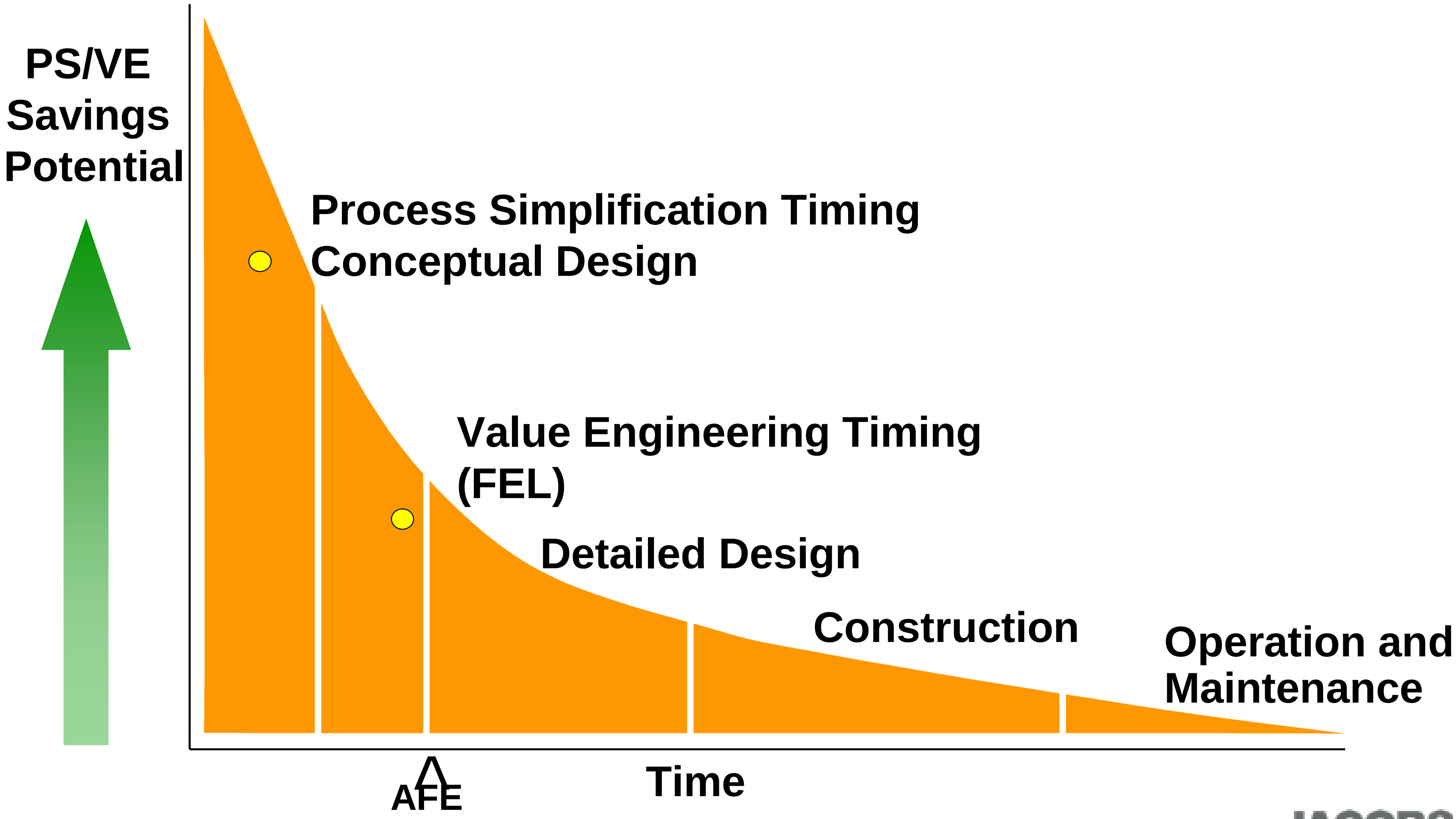
VALUE IMPROVING PRACTICES
Process Simplification & Value Engineering



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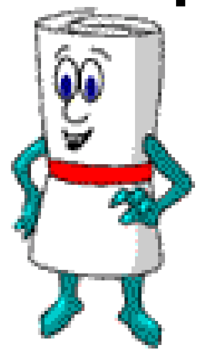
Setting Facility Objectives / Class of Plant

Definition

This practice establishes what quality facility is needed to meet the business goals. It adjusts reliability, expandability, automation, life of the facility, expected stream factor, likelihood of expansion, production rate changes with time, product quality, and product flexibility. The class of plant quality can be used to determine needed design allowances, redundancy, sparing philosophy and room for expansion.



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Setting Facility Objectives / Class of Plant

Objective

- To align the project's design objectives with the Sponsor's objectives (establish the basis for design). Categories are assigned for each of the following process and plant performance characteristics:
  - Capacity
  - Plant life
  - Product quality
  - Flexibility
  - Marginal investment criteria
  - Expandability
  - Reliability
  - Controls and data provisions
  - Maintenance

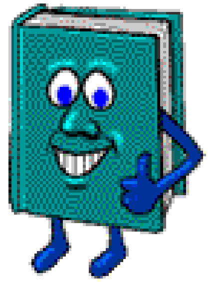
Customizing Standards and Specifications

<u>Definition</u>

An evaluation of the actual needs of the specific facility to be designed. Engineering standards and specifications can affect manufacturing efficiency, product quality, operating costs, and employee safety. However, sometimes the cost of a facility is increased by the application of codes, standards, and specifications that exceed the facility's needs.

<u>Objective</u>

This practice is to optimize facility life cycle costs through establishing the minimum <u>acceptable</u> standards that align with the Project Objectives. This effort should not be confused with using standard industry specifications.



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Energy Optimization

Definition

A simulation methodology for optimizing the life cycle costs by examining power and heating requirements for a particular process. The objective is to maximize the total return based on selecting the most economical methods of heat and power recovery

Objective

The desired result of this VIP will be to add value (NPV) to the project by reducing energy costs by judicious design and focused expenditure of capital.

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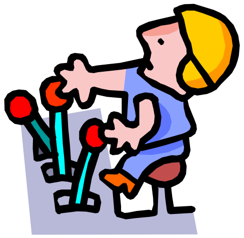
Predictive Maintenance

Definition

An approach to maintaining a facility whereby equipment is monitored and repairs are made before failure. Typically, such an approach requires adding various measurement devices to evaluate operating characteristics.

Objective

To optimize facility life cycle costs through the use of Predictive Maintenance management, techniques, and tools.



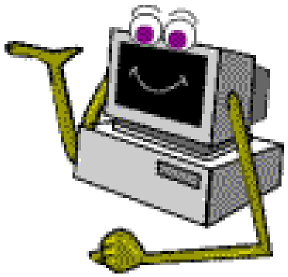
Reliability Modeling

Definition

A simulation technique to examine operability targets for a facility. Typically, specialized computer software and/or a consultant is necessary.

Objective

To determine the most economical sizing, spacing, number of units, and storage conditions that meet operability and maintenance goals while minimizing costs of the Project.



Technology Selection

Definition

A formal systematic process by which a company searches for production technology outside of the company (or, in some instances, in other divisions within the company) that may be superior to that currently employed in its manufacturing plants.

Objective

Select technology that best meets business objective such as: Economic criteria, operability, on-stream time, integration, utilities consumption, flexibility, raw materials, environmental impact.

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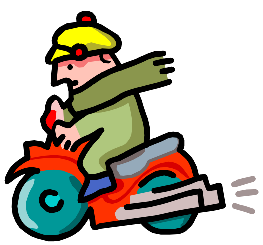
Integrated Computer Aided Engineering

Definition

Extensive use of 3D Computer Aided Design (CAD) during FEL and detailed engineering. The use of 3D CAD also improves visualization for operations and maintenance input and training.

Objective

This VIP will improve visualization of the facility for owner input and training. It also reduces the frequency of dimensional errors and spatial conflicts that cause design changes during construction.



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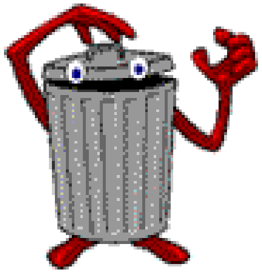
Waste Minimization

Definition

A disciplined approach used during design to minimize the production of waste products. Such an approach might add additional equipment or examine alternate process technologies that have lower waste side-streams.

Objective

To add value to the project by reducing or eliminating non-useful streams that minimize environmental impact. This VIP provides methods and reports that facilitate and document the decisions that are made to minimize this impact.



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Conclusion

VIPs Should:

- **Be Applied at the Optimum Time in the Project and Initiated in the FEL Phase**
- **Follow a Process to Ensure all Principles and Concepts are Followed**
- **Be Documented**
- **Be a Focused Event using an Outside Facilitator**
- **Require Participation by all Appropriate Functions**
- **Planned out ahead of Time as part of the Overall Execution Plan**
- **Be seen as an Integral Part of the Project Execution Plan**

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