THE QUAKER GROUP
DRIVING SUSTAINABLE SOLUTIONS

MOP UP Solution

Maintenance Optimization Planning
&
Upgraded Performance Solution

Contractor and Company Perfomance Improvement Program
Routine Maintenace, T/A's and Small Projects

Bob Snell

July 15, 2010

Relevant Maintenance Qualifications

Recent Projects

ExxonMobil Baton Rouge Planning Improvements

- Evaluated maintenance planning practices and designed site specific solutions
- Conducted on site training for approximately 30 planners using estimating standards
- Implemented Planner assessments and grading process
- Developed end of job sustainability model for site
- Conducted 3 day onsite Planner Training

Gulf Coast Planner Training Conference

- Conducted offsite planner training for several refineries and chemical plants
- Trainining included real world assignments with industrial pictorials
- Received very high course ratings
- Several sites have requested additional on site support

Case Experience: Competitive Assessments & Strategy - Energy

Examples – Not Exhaustive

Client	Business Context	The Quaker Group Approach and Outcome
Casework Credentials		
European National Oil Company	▪ Led an engagement that identified least cost competitive clean product suppliers as well as a robust, market based basis for make-or-buy refined product economics.	▪ For an Eastern European National Oil Company provided a competitive analysis of potential clean product suppliers to meet indigenous demand. The analysis included modeling over 100 Western European, Eastern European, Mediterranean, and North African refineries to determine potential least cost clean product netback suppliers. ▪ The analysis formed the basis for discussions regarding joint ventures, strategic alliances, and toll processing arrangements.
Large international Integrated Oil Company	▪ Performed a rigorous analysis of the impact of US EPA Clean Air Act Amendment mandated limits on US gasoline BTX levels. The analysis led to a rational basis for intra-company transferring pricing between the refining and chemicals business units.	▪ For a major U.S. Oil Company provided a strategic competitive assessment of their North American hydrocarbon solvents business. The scope of the work included an analysis of the break-even economics associated with benzene, toluene, and xylene (BTX) supply and demand in a post reformulated gasoline (RFG) environment in the U.S. and Canada. Refinery modeling, gasoline blending, and BTX transportation logistics were the primary quantitative aspects of this work.

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Examples – Not Exhaustive

Client	Business Context	The Quaker Group Approach and Outcome
Casework Credentials		
Regional Integrated US Oil Company	▪ Identified best case liquid hydrocarbon transportation business opportunities that led to incremental crude supply sources at competitive netback prices..	▪ For a major international West Coast oil company provided a strategic assessment of liquid hydrocarbon transportation business opportunities in Latin America. The scope of the engagement included current and projected crude oil, clean product, and natural gas liquids supply and demand. ▪ The strategic assessment included current and projected barriers to foreign participation in each business sector along with the current and projected competitive environment. The client objective was to leverage core competencies in liquid hydrocarbon transportation with potential Latin American partners in order to access new crude oil supply sources.
Regional US West Coast Refiner and Marketer	▪ Identified most probable, highest netback markets for marginal clean products production for a US West Coast Refinery and Marketer that led to an uplift in tributary spot market petroleum product price realization.	▪ For a major West Coast refiner and marketer developed an Asia Pacific business entry strategy for their downstream businesses. The scope of the analysis included individual country characterizations of the current and projected investment climate, competitive environment, economic and fiscal factors, and regional refined product price forecasts. A critical aspect of the analysis included Asia Pacific price setting mechanisms and trade projections.

Case Experience: Operations Performance Improvement - Energy

Examples – Not Exhaustive

Client	Business Context	The Quaker Group Approach and Outcome
Casework Credentials		
European National Oil Company	▪ Provided rigorous assessment of national oil company's distribution network that led to a consolidation of terminal assets and transportation costs leading to a cost reduction of up to 30%.	▪ Provided consultation to a Central European National Oil Company regarding the rationalization of clean product distribution assets. The engagement involved training and mentoring local consulting staff as well as the client team. The deliverable involved development of an LP model for all of the country's clean product transportation and storage assets and subsequent recommendations leading to a reduction in fixed and variable costs of up to 30%.
Large international Integrated Oil Company	▪ Performed an analysis of a large national oil company's refining and marketing downstream assets that identified cost and yield enhancements leading to margin improvement of up to 35 cents per barrel.	▪ Completed and presented a Benchmarking study of the Saudi Arabian Marketing and Refining Company's wholly owned and joint venture refineries. The scope of the study included opportunities for continuous improvement in the areas of operating cost reduction, yield enhancement, asset protection, inter-divisional and intra-divisional interfaces and human resource management.
Regional Integrated US Oil Company	▪ Identified and implemented best practice operations performance evaluation processes that led to top quartile operating cost and normalized high value products yield.	▪ For a Canadian independent refiner and marketer developed enhanced unit-level reporting and operator performance measures for a 200,000 BPD top-quartile refinery. Collected information on a unit level (such as feeds, energy consumption, catalyst, yields, etc.) and trained operators to utilize such information to make daily and hourly decisions to uplift the unit or reduce costs.

Case Experience: Operations Performance Improvement - Energy

Examples – Not Exhaustive

Client	Business Context	The Quaker Group Approach and Outcome
Casework Credentials		
Eastern European National Petrochemical Company	▪ Provided operations improvement advice to a company emerging from communism into a free market system. The work led to increases in free cash flow and a higher capitalized cash flow valuation in a public equity offering.	▪ For an Eastern European National Chemical Company provided a benchmarking analysis and valuation on the basis of capitalized cash flow to identify areas for profitability improvement. The purpose of the study was to improve the profitability of this national petrochemical company prior to privatization through the issuance of foreign equity capital.
Regional US Refiner and Marketer	▪ For the executive committee of a niche U.S. refiner and marketer provided business formation assistance to maximize shareholder value.	▪ The assessment included potential joint venture or strategic alliance partners to form separate companies that would allow for the spin-off of underperforming assets without raising the company's cost of capital. The scope of work included characterizations of all West Coast refiners and marketers on the basis of supply security and competitive retail position in various geographic areas.

Case Experience: Operations Improvements - Oil and Gas

Examples – Not Exhaustive

Client	Business Context	The Quaker Group Approach and Outcome
Case work Credentials		
Large regional US Refiner/Chemicals	▪ Led a team of Engineers, First Level Supervisors and Programmers to design and implement site operations and maintenance improvement practices. Reduced overall costs by 15% to 30%.	▪ Evaluated existing practices and identified productivity and cost gaps. Designed , implemented, trained and coached organization on how to install new practices and capture cost savings. Realized a 15% to 30% savings across all operations. ▪ Achieved 1st Quartile Solomon performance.
Large regional European Refiner	▪ Conducted diagnostic and peer assist to reduce maintenance costs by streamlining processes.	▪ Conducted a benchmarking analysis of the maintenance functions for a major European refining company, recommended Work Selection, Planning, Scheduling and Execution improvements along with 20% staffing reductions.
Large integrated US Oil and Gas	▪ Managed maintenance for half of the site operating facilities and realized improved Safety and cost reductions.	▪ Provided leadership to execute maintenance using improvement techniques. Trained direct reports to become better leaders and expect improved performance from their field crews. ▪ Set new Safety expectations and led group to a 7 year string without a recordable injury.

Case Experience: Operations Improvements - Oil and Gas

Examples – Not Exhaustive

Client	Business Context	The Quaker Group Approach and Outcome
Case work Credentials		
South America Oil and Gas Refiner	▪ Conducted a site peer assist and diagnostic to reduce operating costs.	▪ Evaluated existing Planning , Scheduling and Execution practices and recommended organizational, system and work process changes to reduce field staffing by 30%. ▪ Recommended changes to improve safety performance.
Americas Oil and Gas Refiners	▪ Led Network of Maintenance Second Level Managers to design improvement Best Practices.	▪ Designed and implemented majority of Best Practices being used by all sites to achieve maintenance efficiencies and staffing reductions.
Americas Oil and Gas Refiner	▪ Solomon Rankings Improvement – Mass Balance	▪ lead an effort to improve their overall refinery boundary material balance from a "lowest quartile" Solomon ranking. This effort determined and corrected the factors leading to a 98.5% balance and improved it to a 99.8% balance overall without significant cost requirements. The main drivers were finding and correcting major errors in the calculations as well as making sure that the data was correct and verifiable. Produced guidance for on-going correction of unit to unit material balance to correct as much as +/- 40% unit imbalance to provide a targeted +/- 1% balance. Taken in total, this has been identified to result in potential savings of greater than $100MM annually.

Case Experience: Competitive Assessments & Strategy - Energy

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Case Experience: Organizational Restructuring - Energy

Examples –
Not Exhaustive

Client	Business Context	The Quaker Group Approach and Outcome
Casework Credentials		
Large regional refiner and marketer	▪ Led the an engagement that consolidated the distribution and retail operations of a large regional refiner and marketer.	▪ Reviewed alternative organizational models for consolidating distribution and retail operations of a large regional refiner and marketer, enhancing customer retention, reducing costs, and improving service.
Large regional European refiner and marketer	▪ Reduced refinery maintenance cost by as much as 40% for a large European refiner.	▪ Provided a benchmarking analysis of the maintenance functions for a Northeastern European refining and marketing company, recommending a staffing reduction of 40% and outsourcing of non-core activities.
Large integrated European national oil company	▪ Performed a benchmarking and restructuring implementation plan for an integrated downstream oil company that included refining, distribution, marketing and shipping supply chain segments.	▪ Provided organizational restructuring analysis that focused on Refining, Distribution, Marketing, and Shipping Divisions for an East Asian National Oil Company, identifying areas for improvement and cost reduction; as well as a road map for implementation.

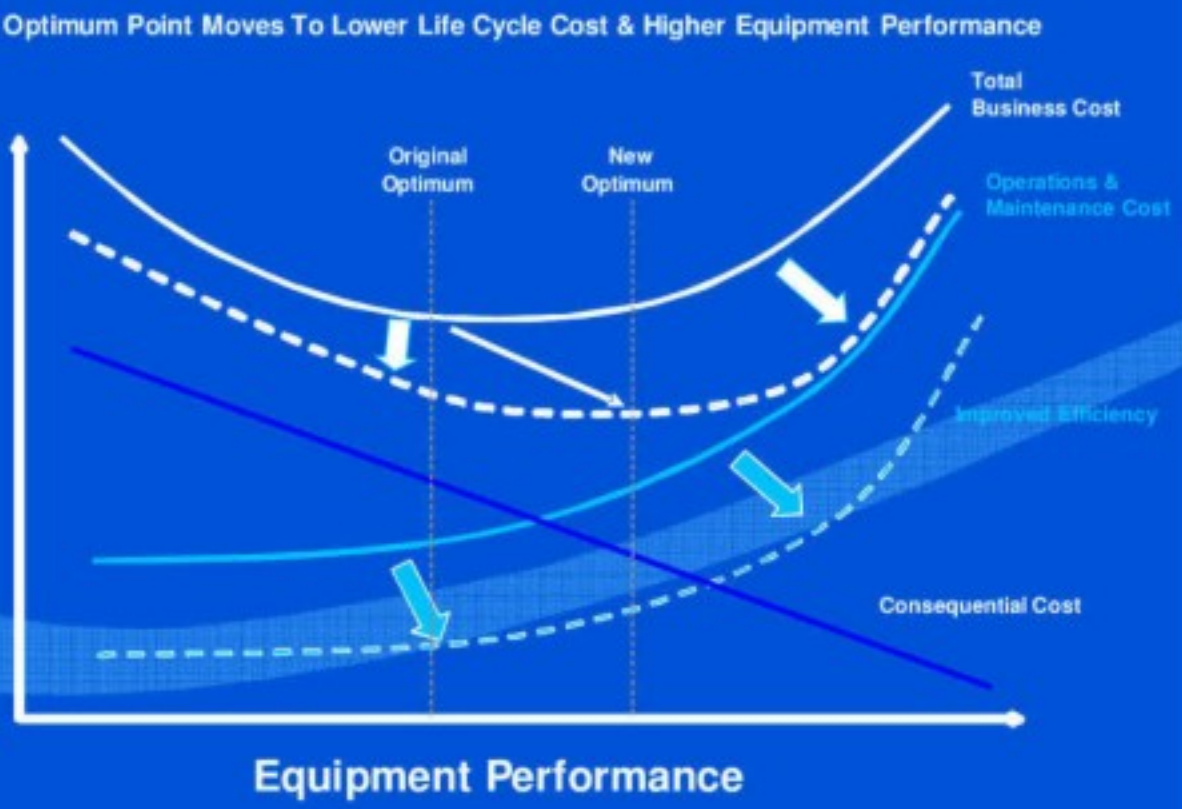
Quaker Group Maintenance Optimization & Performance Upgrade (MOP UP):

Integrated Performance Discussion

Maintenance Optimization

- The Optimum Maintenance Strategy Will Comprise A Mix Of:
  - Preventive
  - Predictive
  - Reactive Tasks
- All Activities Will Be Targeted According To Equipment:
  - Criticality
  - Failure Mode Consequences
- The Impact Of This Is To :
  - Increase Maintenance Efficiency
  - Enable Reduced Costs
  - Improve Equipment Performance

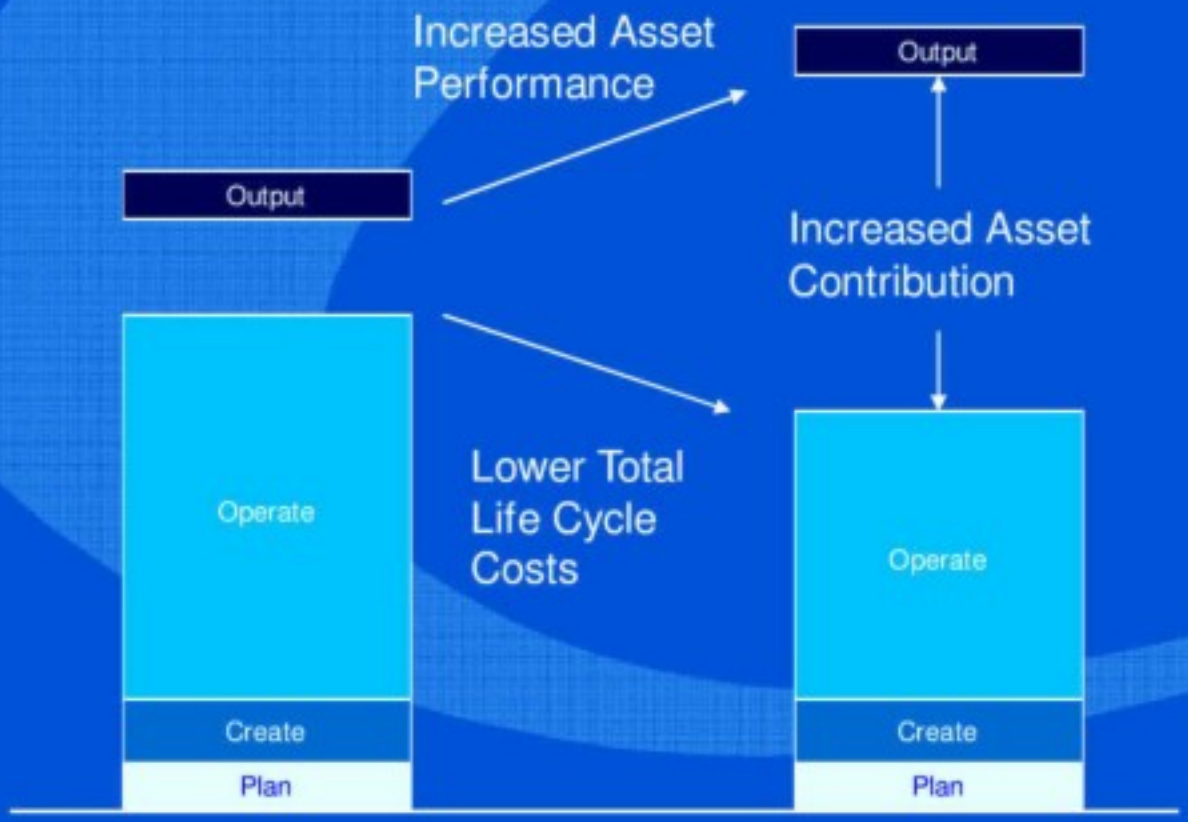
Impact Of Increasing Maintenance Efficiency



Streamline Processes & Services

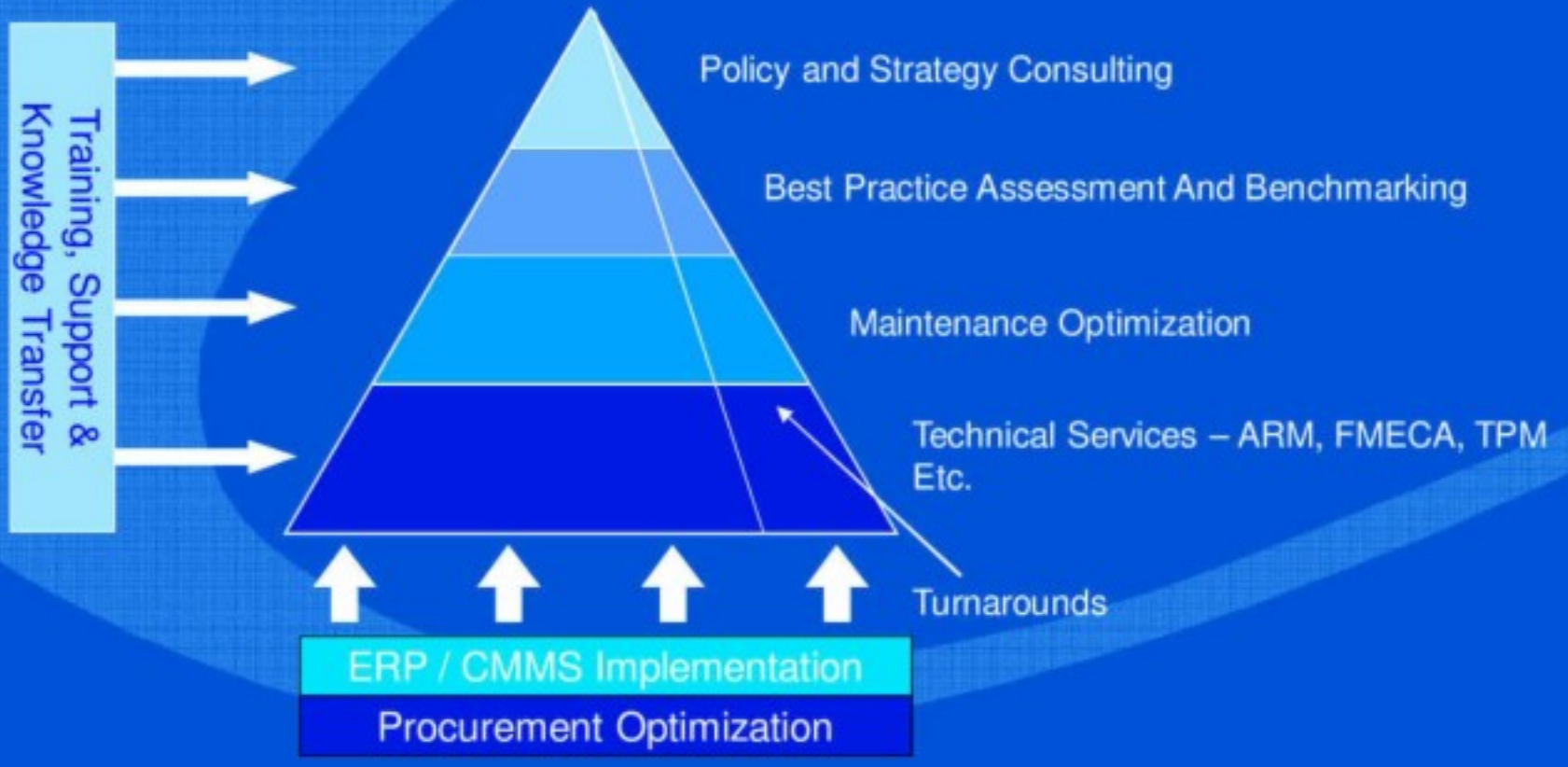
- Capital Program Optimization
- Strategic and Tactical Operations & Maintenance Planning

Asset Contribution Benefits from Streamline Processes

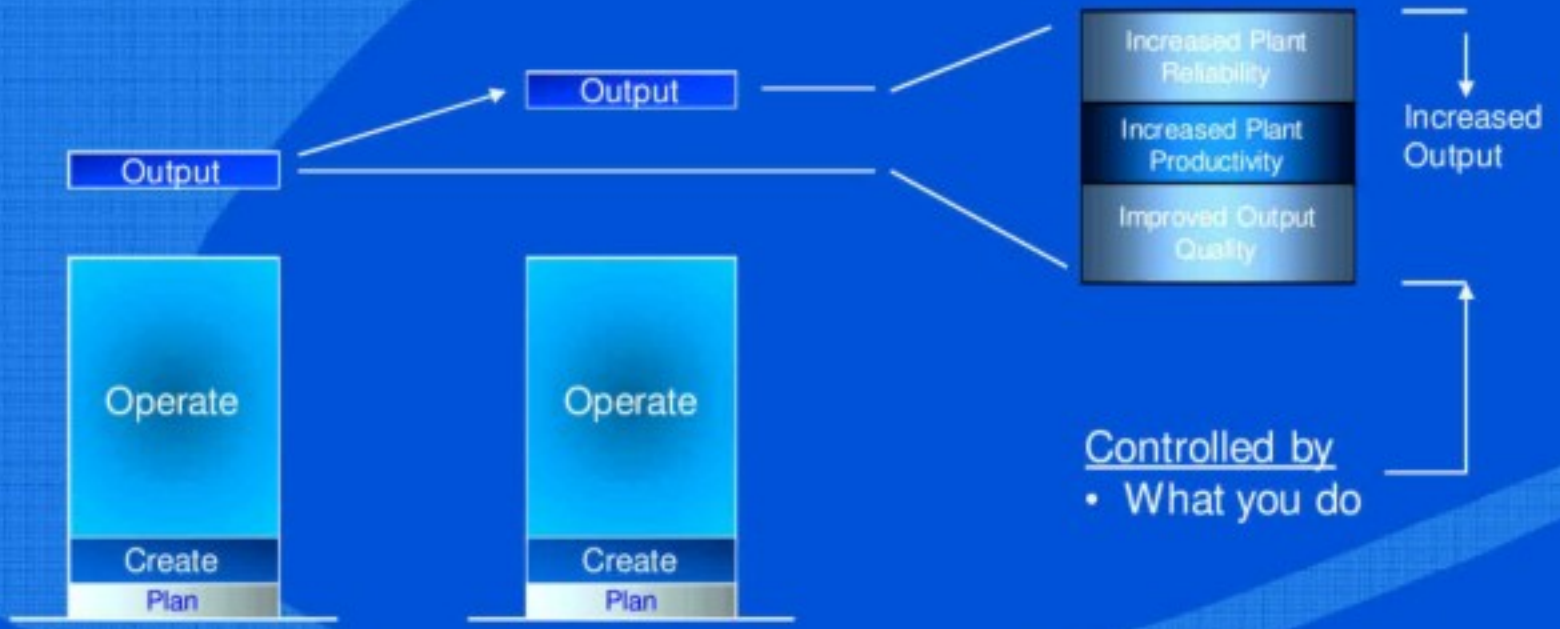


The Quaker Group products and services deliver improved asset contribution by assisting clients in streamlining their processes throughout the assets life cycle.

Whole Life Cycle Asset Management

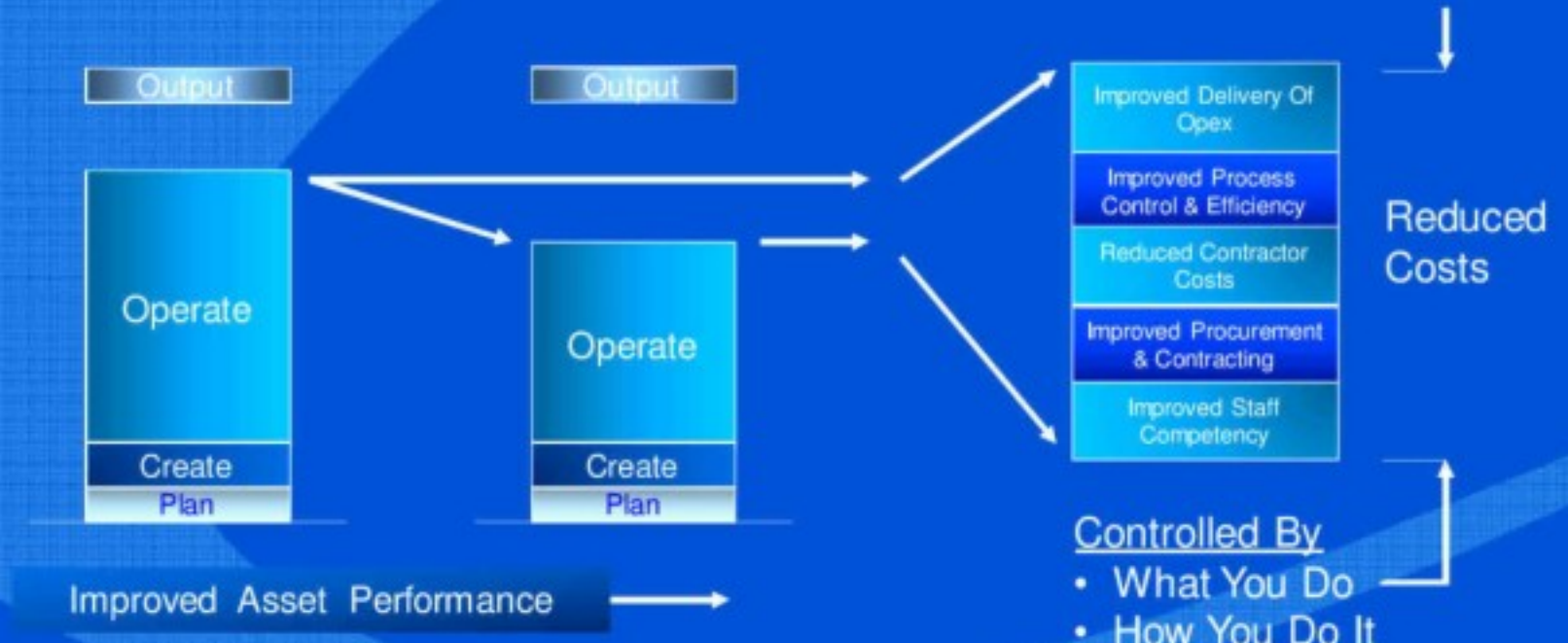


Introduction –
Asset Contribution and Output



What you do – Determined by Maintenance and Asset Optmization

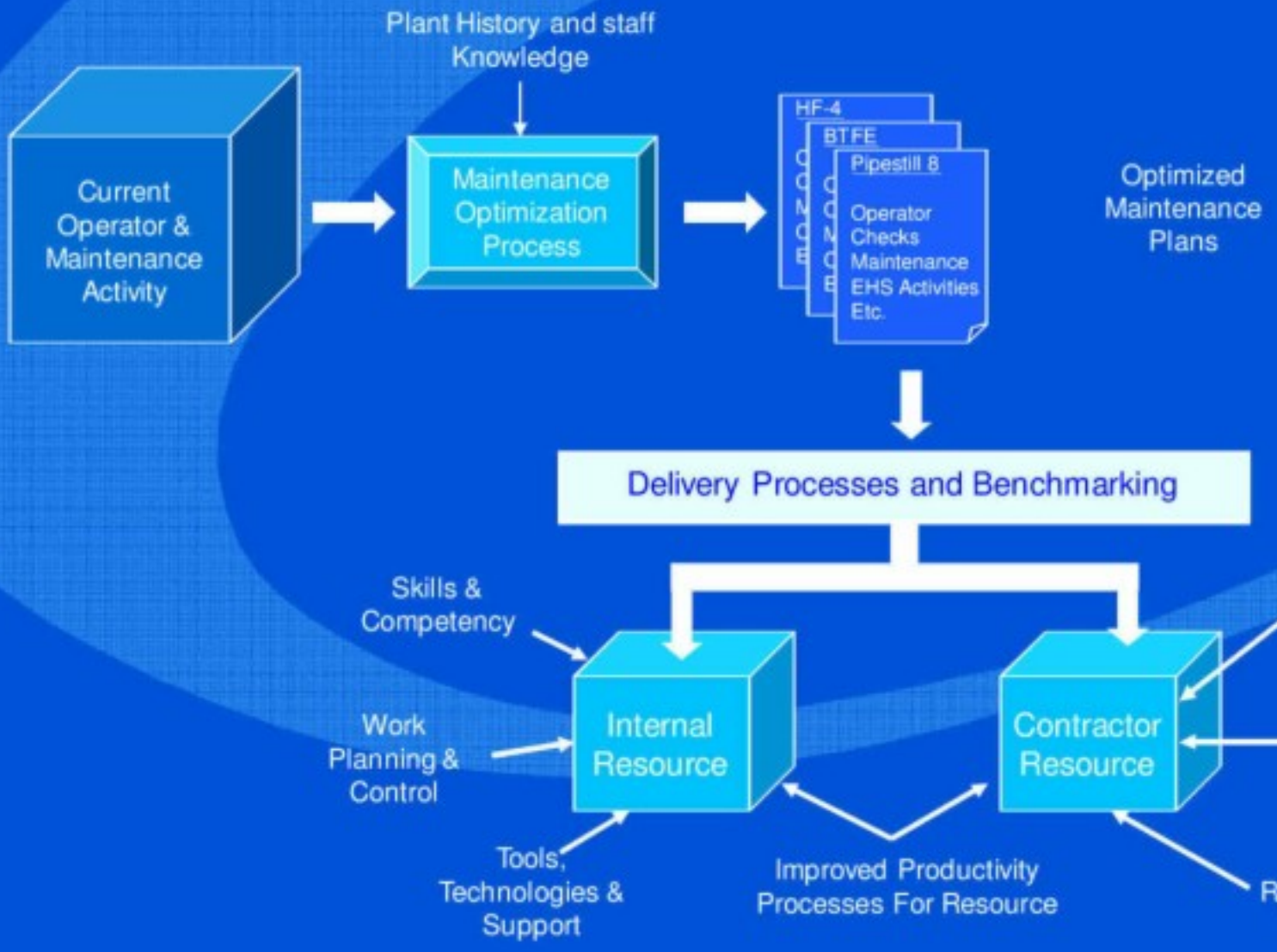
Introduction – Asset Contribution and Operating Costs



What You Do – A Function Of Asset Confirguration And Optimization Based N Market Demands

How You Do It – A Function Of Processes And Capabiltities Leverged By Technology

Whole Life Cycle Asset Management



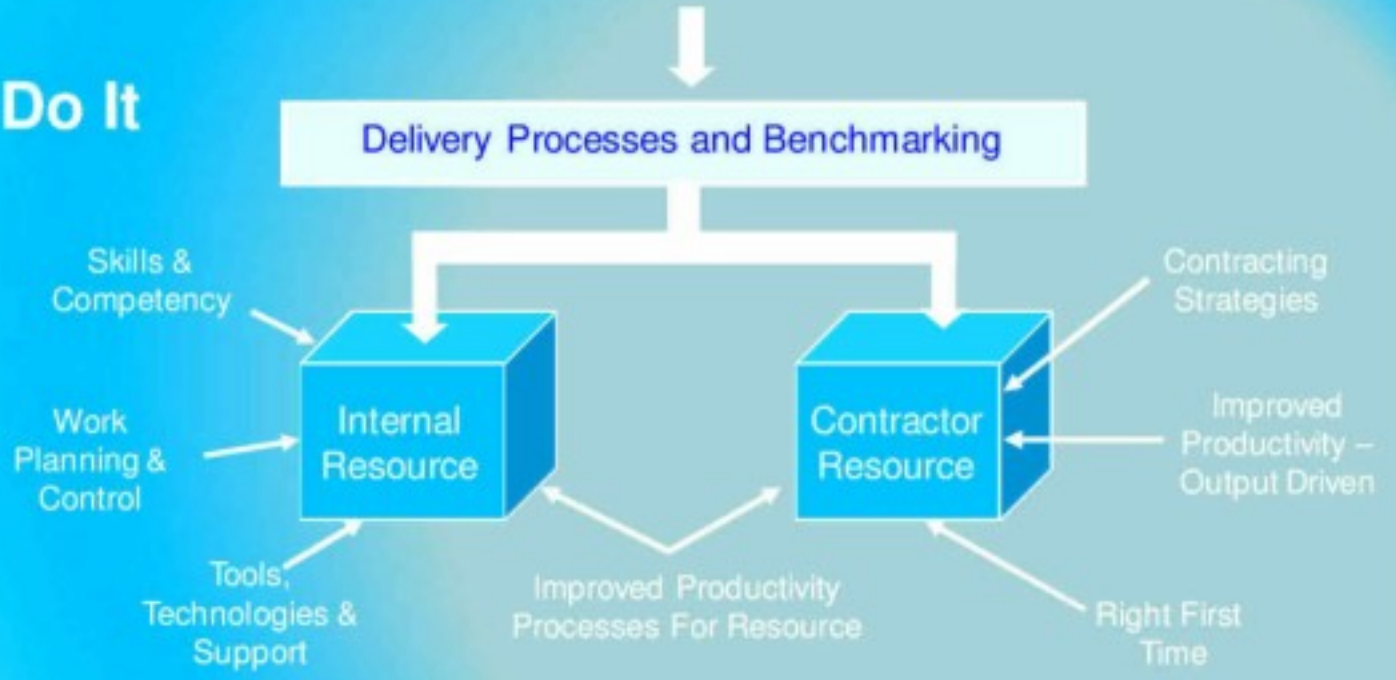
Whole Life Cycle Asset Management

What You Do

Optimized Maintenance Plans

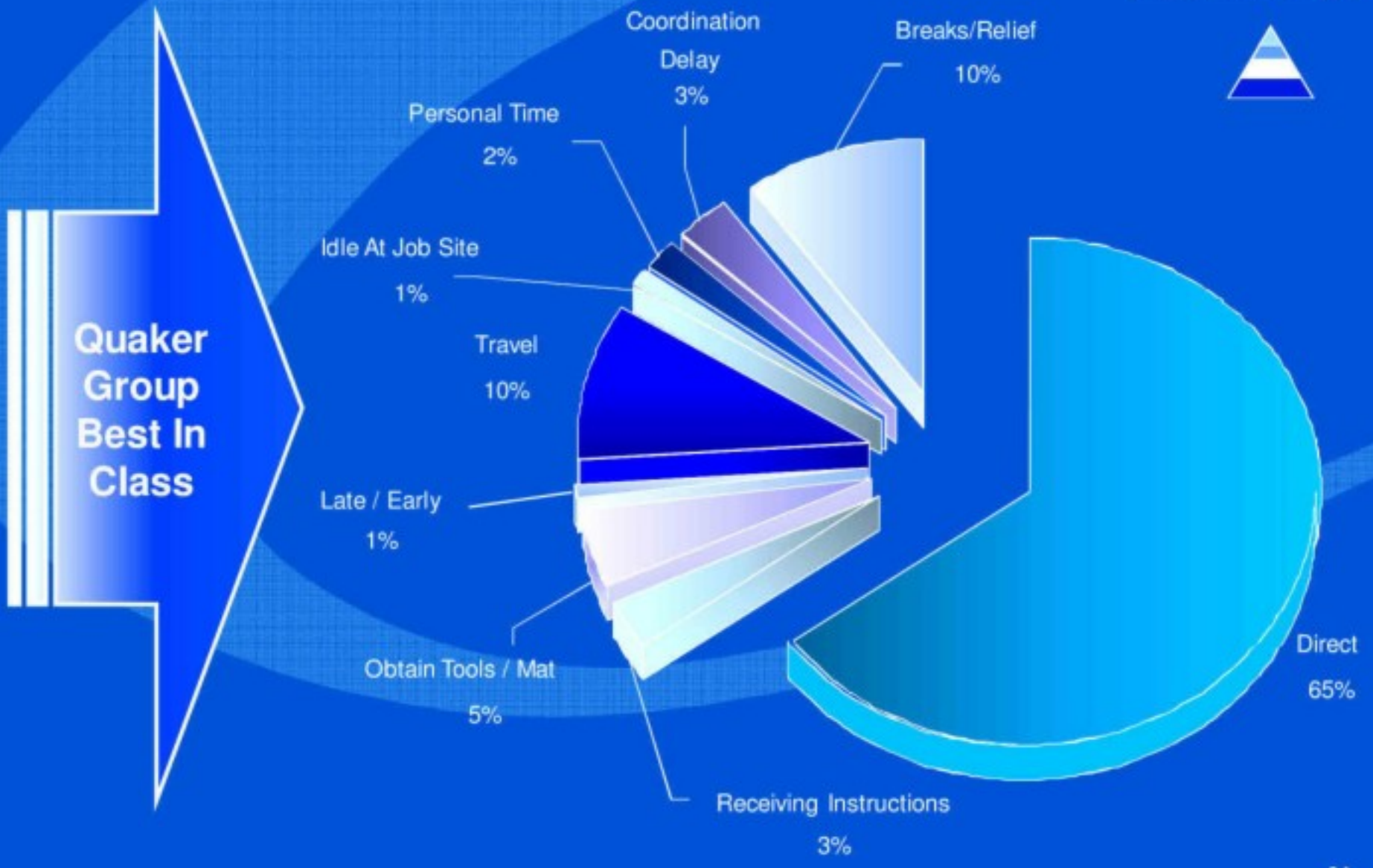
Whole Life Cycle Asset Management

How You Do It

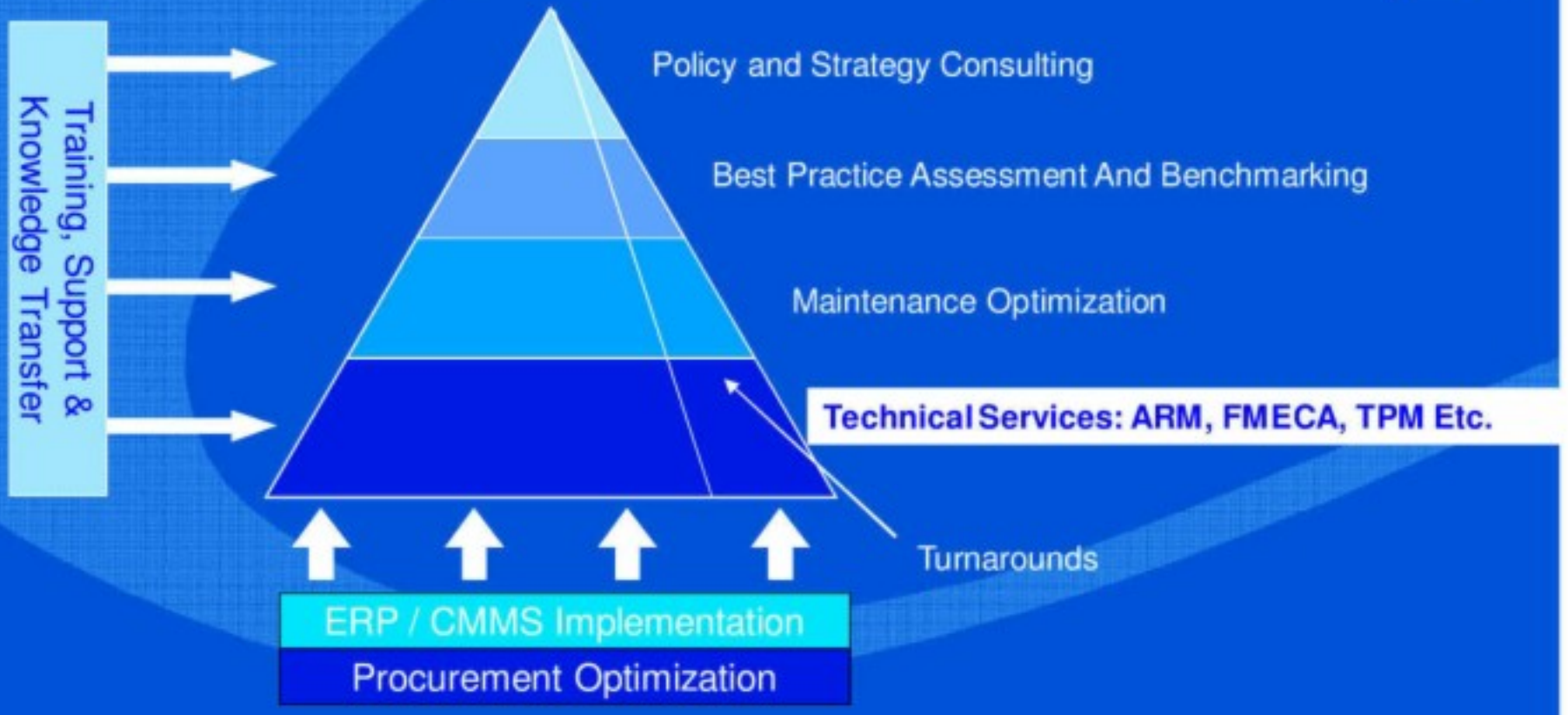


Quaker Group Maintenance Performance Improvement Sustainability Discussion

Target Manpower Utilization



Whole Life Cycle Asset Management



Quaker Group Technical Services


Formula 1: Calculating Average demand during lead time $E(x)$

$$E(x) = E(L) \times E(D)$$

where $E(L)$ is mean of the length of lead-time, and $E(D)$ mean of the demand in unit time period

Formula 2: Calculating minimum stock levels for A/B class Slow Moving Items (s)

$$\sum_{x=0}^{s} \frac{(\mu_{lt})^{x} \exp(-\mu_{lt})}{x!} \geq p$$

where μ_{lt} is expected or forecasted demand over replenishment lead-time, and p, service level which depends upon the criticality of the spares:
For Vital Item $p = 0.99$
Essential Item $p = 0.95$
Desirable Item $p = 0.70$
S is the maximum level
Minimum stock level can therefore be calculated as:
$s = S - 1$

Formula 3: Calculating minimum stock levels for A/B class Fast Moving Items (s)

$$s = E(x) + SS$$

where, $E(x)$ is the mean of the demand during lead-time (see formula 1);
and where SS (Safety stock) is calculated using the statistical formula:

$$SS = k\,\sigma_{LT}$$

where, σ_{LT} is standard deviation of the demand during lead-time,
and k, safety factor. The safety factor is a function (value 0-4) of the desired probability of not running out of stock. Eg for a 99% probability, the safety factor is 2.33

Formula 4: Calculating min stock levels for C class Fast and Slow Moving Items (s)

$$\text{Opt.s.put} = \sqrt{E(LT+T)\,\text{var}(D) + E(D)^2\,\text{var}(L)}$$

Safety Stock

$$SS = k\,\text{Opt.s.put}$$

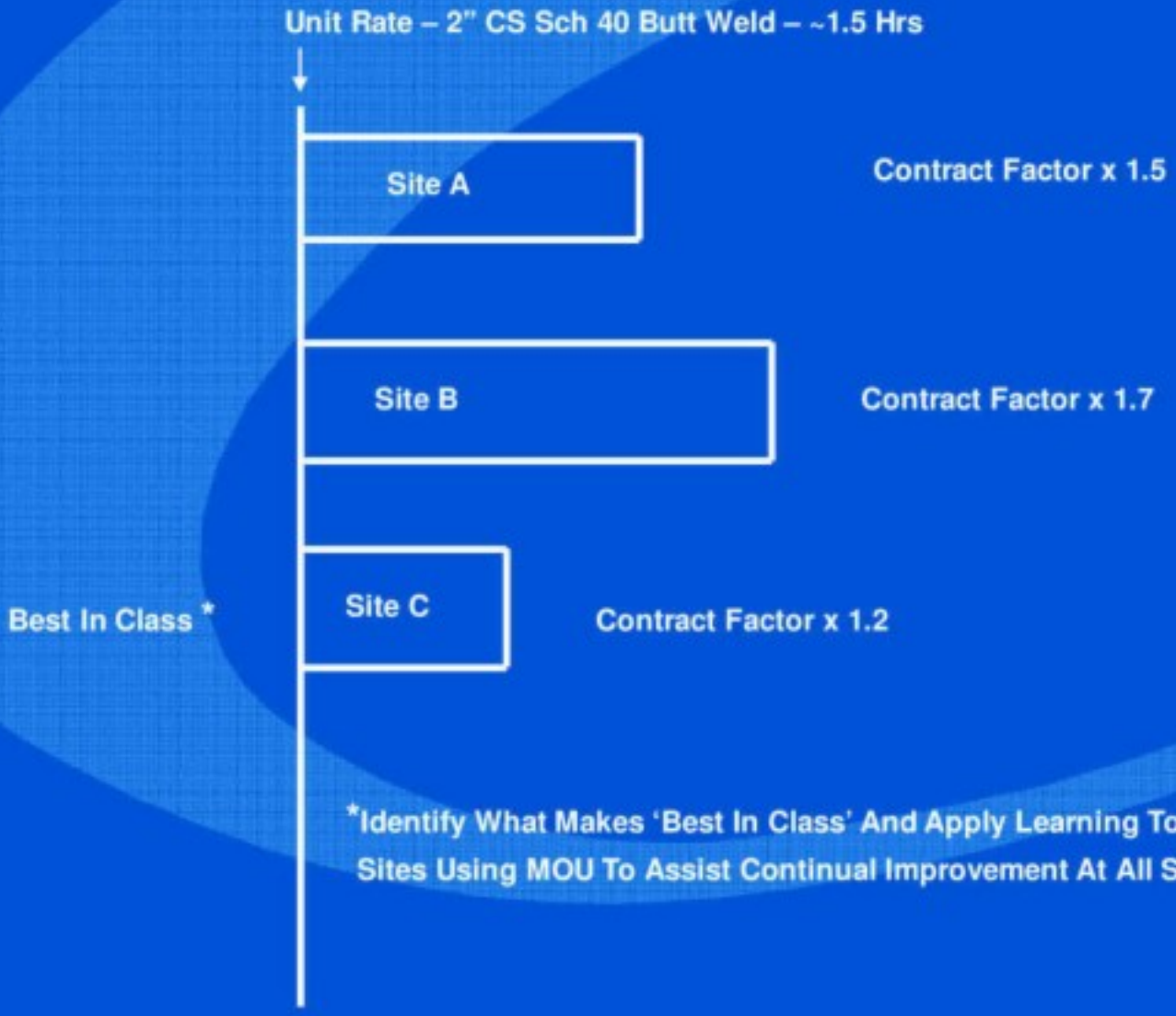
where, Opt.s.put is the standard deviation of demand during review period(R) and lead-time (L)
$s = E(D) \times (R + L) + SS$
where, $E(D)$ is the average yearly demand; $E(L)$ average lead time in years; and k, the factor of safety

The Quaker Group Can Either Educate And Train Staff To Complete These Activities Themselves Or Provide Resources To Assist In The Following Technical Areas:

- Arm Analysis – Availability, Reliability, And Maintainability Analysis Completed As Part Of Front End Design Work, Or Ongoing Improvement Programs For Built Assets
- FMECA And RCA – Failure Mode, Effects, And Criticality Analysis, And Root Cause Analysis
- TPM And OEE – Total Productive Maintenance (Continuous Improvement Techniques, 8d, Autonomous Maintenance, Etc.) And The Implementation And Use Of Overall Equipment Effectiveness
- Asset Verification – Where A Client Has A Large And Diverse Asset Base We Assist Them With The Verification Of The Physical Assets And The Subsequent Population Of The Asset Information Within The ERP / CMMS System.
- Condition Monitoring – Working With Technology Partners We Are Able To Provide Fully Outsourced Condition Monitoring Services That Utilize Advance Web-delivery Systems To Ensure Up To The Minute Information Display.

Unit Rate Advantage

Unit Rate Benefits

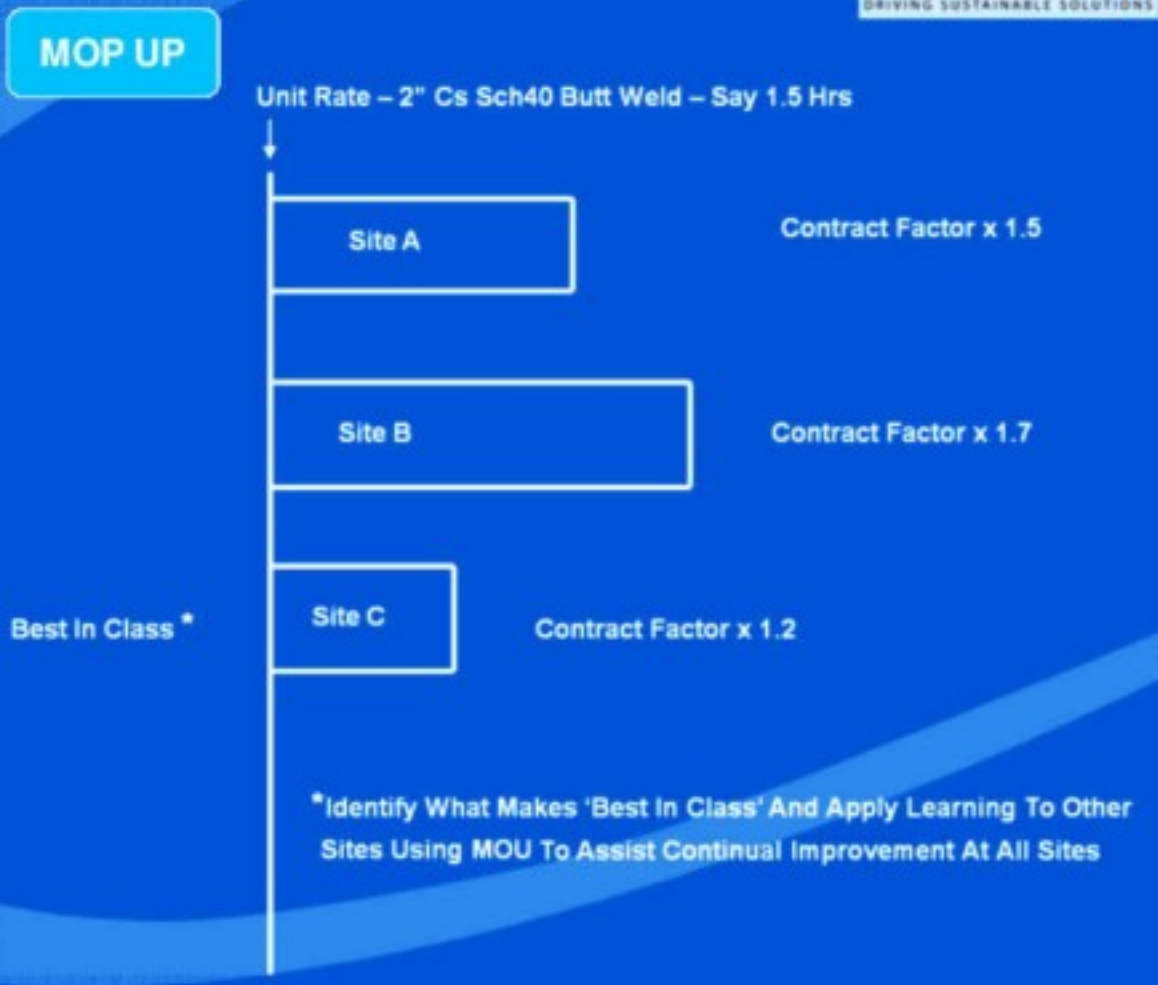


*Identify What Makes 'Best In Class' And Apply Learning To Other Sites Using MOU To Assist Continual Improvement At All Sites

Unit Rate Benefits

MOP UP Enables Normalized KPIs:

- Which Is Productivity Driven
- Which Can Be At Activity Level Right Through To Site / Contractor Level
- Uses Standard Base Data For
- Accurate And Cost Independent Assessment
- Aligned Objectives For All Stakeholders
- Contract Transparency
- Reduced Transaction Costs
- Credible Cross Fertilization Of Best0in-class Processes
- MOU Continuous Improvement

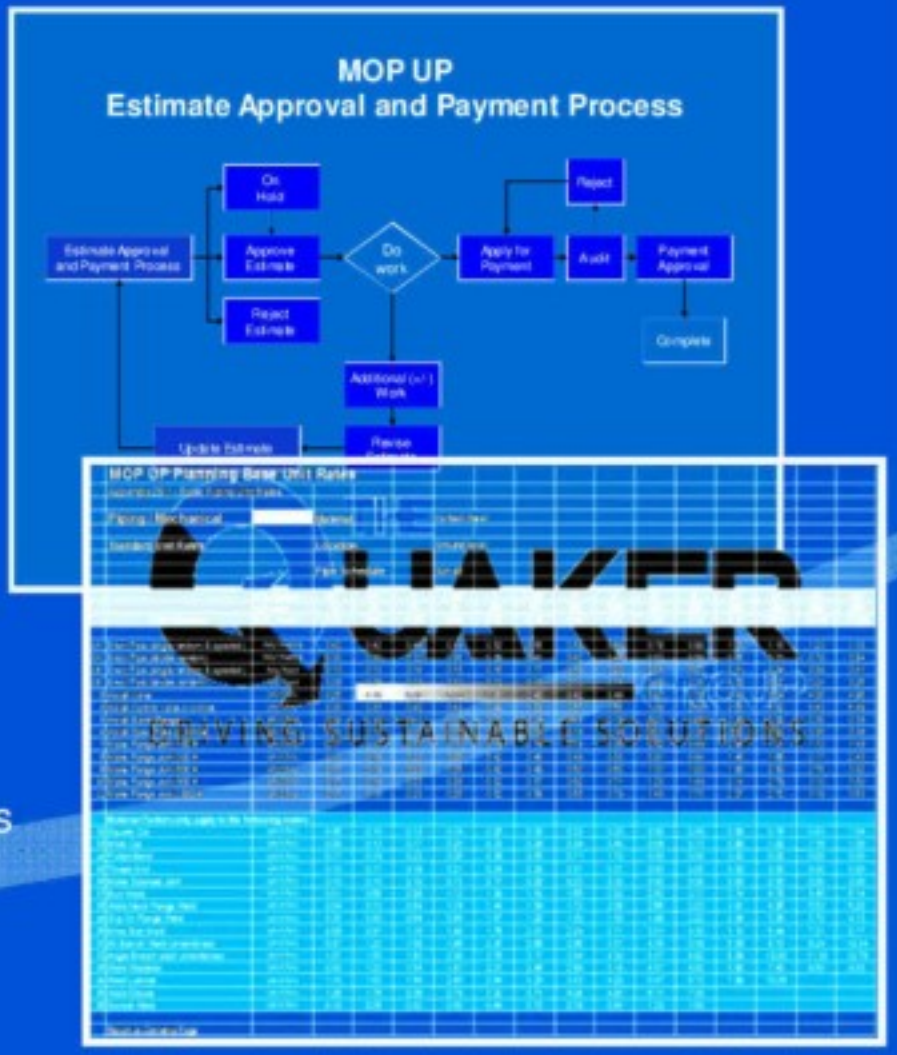


Unit Rate Characteristics

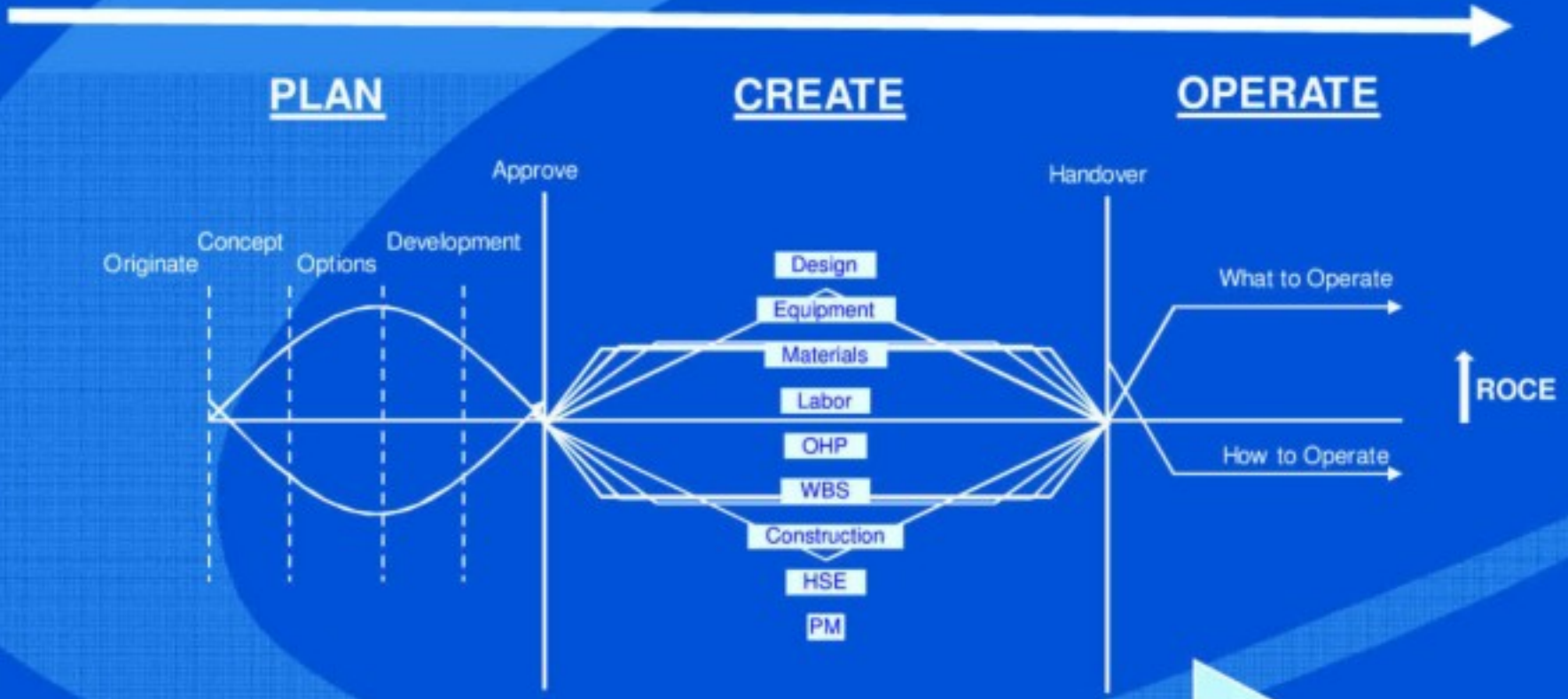
Differences	Work Unit Rate ($ / Hr)	Unit Ra (Hours)
• Fixed Cost For Work Activity ($ / Ft² Set)	✓	✓
• Fixed Contract Periods	✓	✓
• Competitively Bid	✓	✓
• Visibility Of Cost Breakdown	X	✓
• Visibility Of Overheads / Profit And Risk	X	✓
• Efficiency Driven Procurement System	✓	✓
• Identification Of Cost Factors (Productivity / Location Etc.)	X	✓
• Right First Time	✓	✓
• KPI Structured System	X	✓
• Continual Improvement Proce[redacted]ough MOU's	X	✓
• Allows Identification / Quantification Of 'Buying The Risk'	X	✓
• Turnover Drivers Removed	X	✓
• Can Be Normalized To Benchmark Productivity	X	✓

MOP UP Description

- Is A Web Based Transactional Tool That Supports
  - Planning
  - Scheduling
  - Estimating
  - Procurement
  - Transactions
- Can Be Used To Estimate And Manage CAPEX And OPEX
- Is A Support Platform That Is Able To Manage 3rd Party Contracts, e.g. Unit Rate, Lump-sum, Turnkey, Etc.
- Enhances Visibility And Transparency Of Cost Across Maintenance Activities And Projects
- Provides An Objective Basis For Aligned Internal And External Stakeholder Objectives And Motivations
  - Transparently
  - Normalized
  - Across Business Units & Regions



MOP UP And The Asset Lifecycle

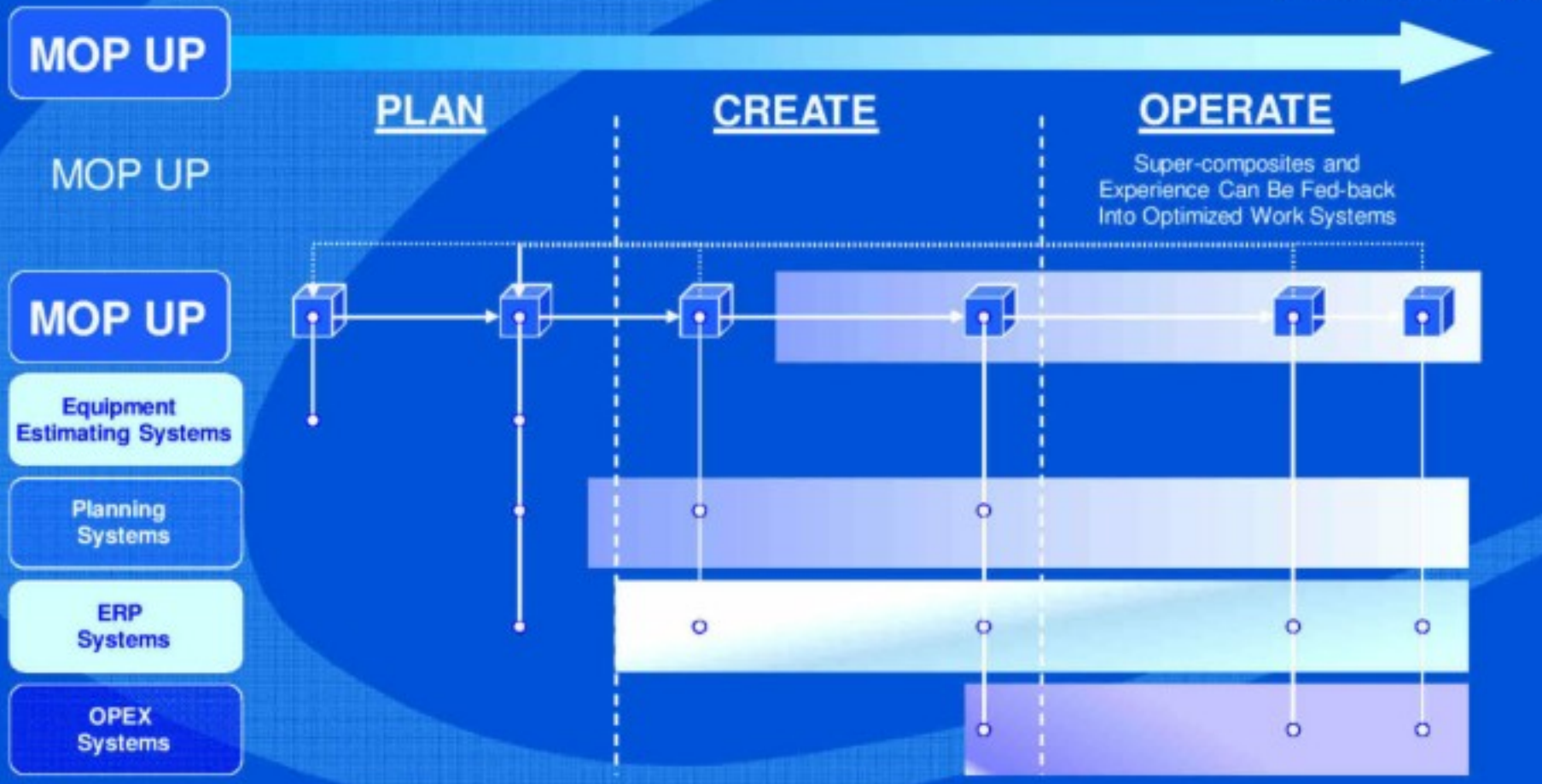


Aspen Icarus

Quaker Group MOP UP

MOP UP supports the best-in-class maintenance planning, estimating, construction and procurement, and contract management associated with all aspects of the asset lifecycle

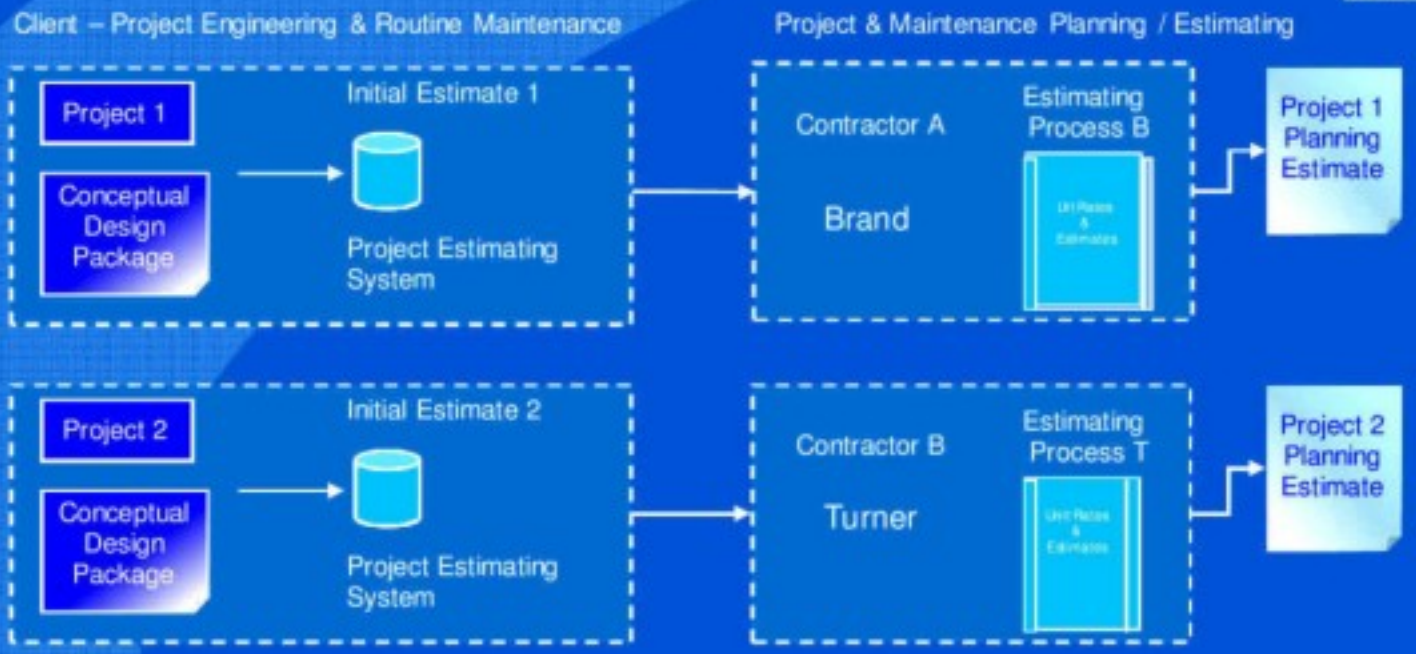
MOP UP and the Asset Lifecycle



MOP UP:

- Can Be Used At All Stages Of The Asset Lifecycle
- Interfaces With Relevant Systems At All Stages Of The Asset Life-cycle And Is Able To Import / Export Required Information
- Enables Efficiency Gains Through The Creation, Use, And Re-use Of Super-composites (Templates) For Programs Of Work
- Is A 'Live' System That Uses Heuristics To Update SAP Data To Continuously Improve And Validate Planning Estimates

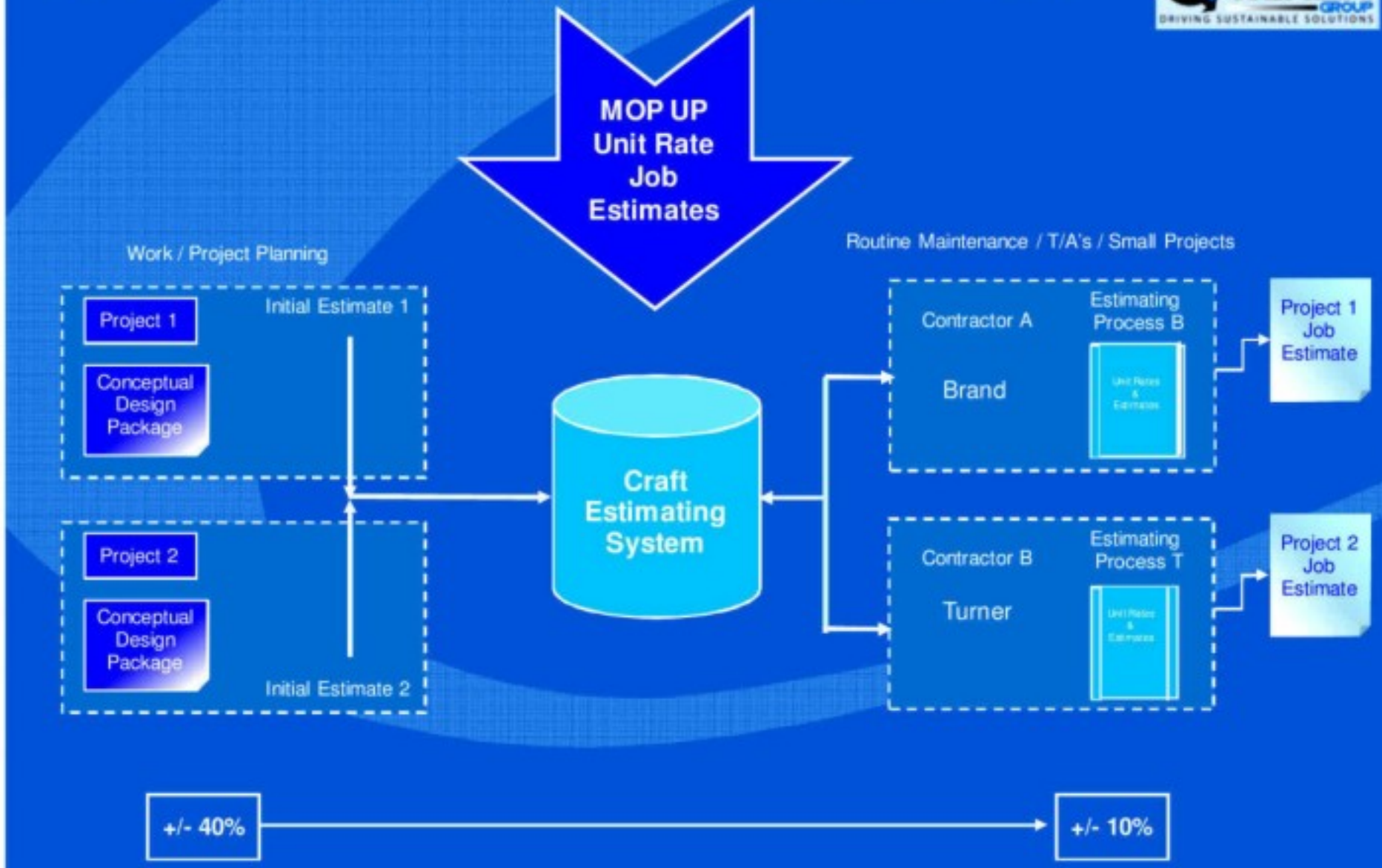
Legacy Approach – Plan Phase



Historical Process:

- Three Data Transfer Stages
  - Inital Design Egineering And Planning
  - Process Unit Estimating System
  - Equipment Based Estimating System To The Project Contractor's Estimating System
- This Introduces Inefficiency And Lack Of Consistency Of Process
- Differing Engineering Contractors Will Use Thier Own Data Sets And Differing Estimating Processes Leading To Inconsistency And Increased Risk
- All Knowledge And Data, e.g., Unit Rates Are Developed And Retained By Engineering Contractors Within Their Own Systems

Quaker MOP UP Approach – Plan Phase

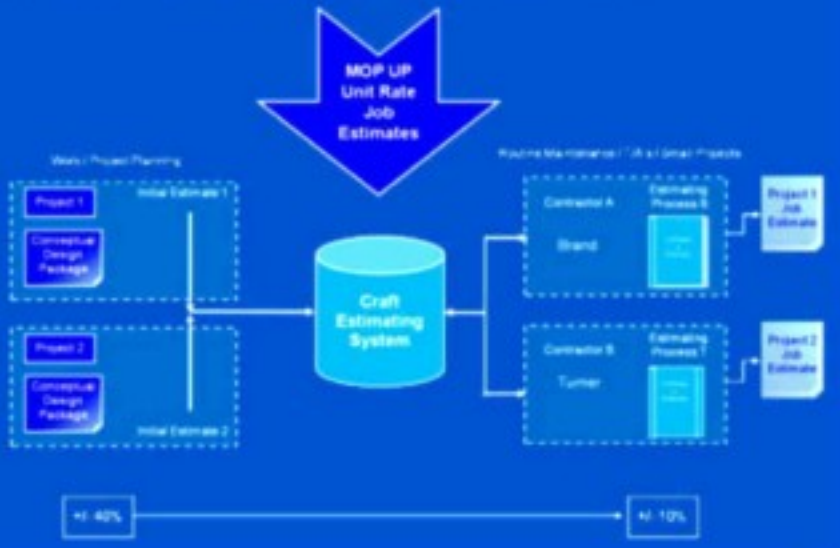


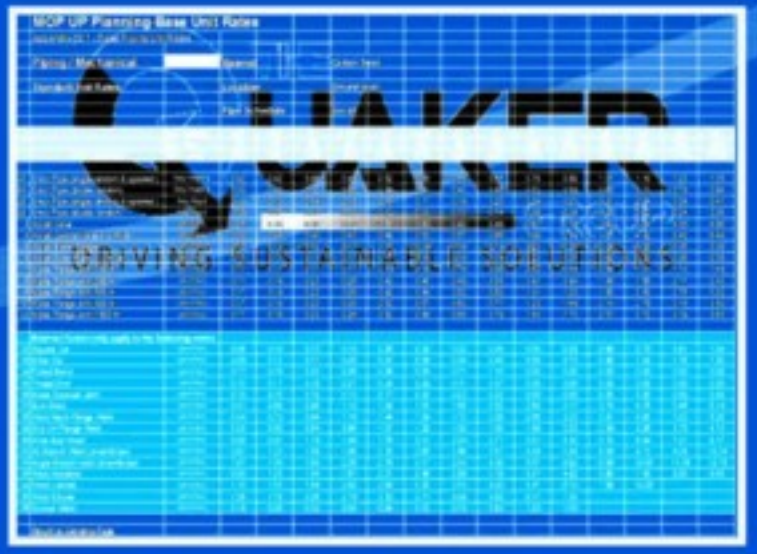
MOP UP Approach – Plan Phase

MOP UP Approach:

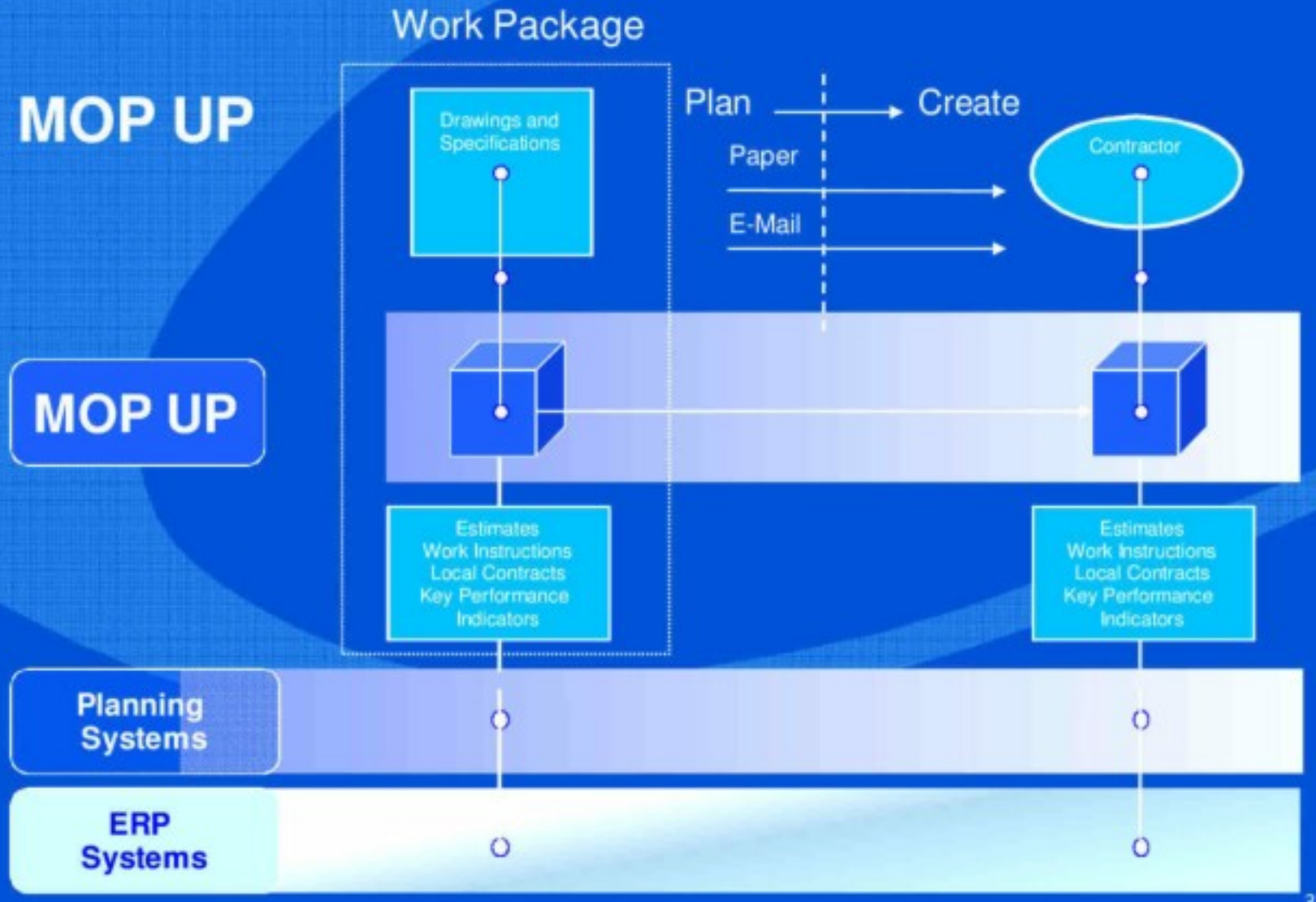
- MOP UP Is Used Both For The Creation Of The Initial Estimate And By The Field Contractor For The Detailed Estimate.
- Reduced The Number Of Data Transfer Stages From 3 To 2 – Improving Efficiency.
- Both Client And The All Contractors Are Using The Same Base Data Sets Ensuring Consistency, Accuracy, And Standardization Of Output.
- The Knowledge Is Grown (Heuristically) And Retained Within The Client's Mop Up System Delivering Internal Knowledge Growth And Improved Efficiency Of Operation As Well The Ability To Normalize & Benchmark
- MOP UP Is Unique In That It Includes A Seamless Scheduling Optimization Function And Interface

Quaker MOP UP Approach – Plan Phase





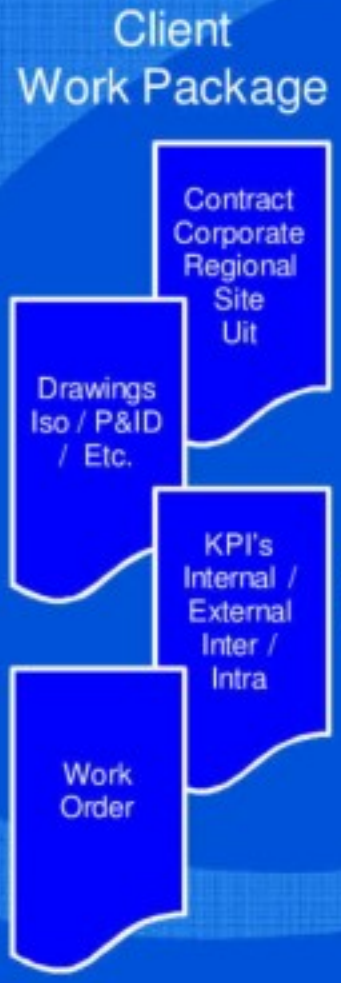
MOP UP Methodology – Create Phase

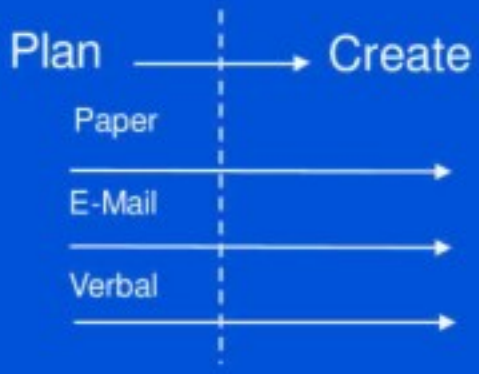


Legacy Contract Management Methodology – Create Phase

Legacy Contract Create Process

- Following The Design Work – The Client Work Pack Will Be Issued To The Contractor In A Variety Of Forms:
  - Via E-mail
  - Via Hard Copy
  - Via Verbal Communications
- This Introduces In-efficiencies And Potential For Error And Unnecessary Non-value Add Activities



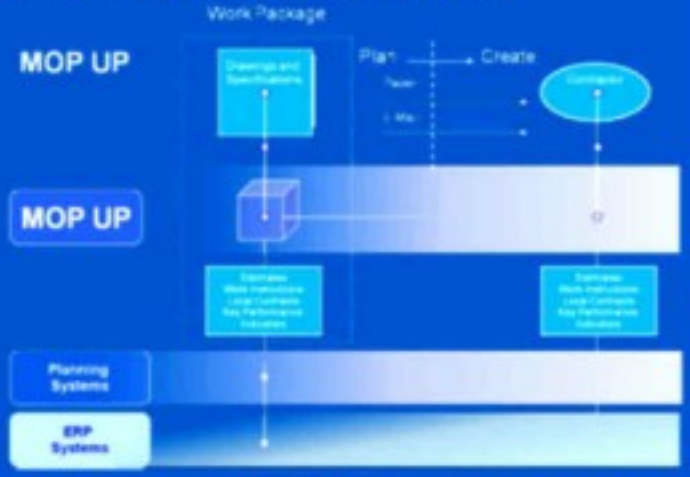


Quaker MOP UP – Creation of an Estimate

MOP UP:

- Estimates Are Created From The MOP Up Unit Rate Proprietary Data Base To Provide The Basis For The Planning & Scheduling Estimates As Well As The Contract Form.
- Each Estimate Can Be Saved As A Template And Be Used To Create Composite Estimates Shared Globally (See Slide).
- Estimates Can Be Single Or Multi-discipline And Be Of Any Size Or Complexity And Can Be Re-used Any Number Of Times For Different Projects / Activities At Other Sites
- MOP UP Has Unique Capabilities To Perform The Scheduling Function Once The Detailed Estimate Is Complete And Interfaces Seamlessly With The Detailed Plan.
- Crew Make-up, Crew Size And Time And Material Estimates Provided By Mop Up Provide A Benchmark For Identical Or Similar Activates Globally.

MOP UP Methodology – Create Phase



Unit Rate / Crew Make-Up Basis Estimate Detail

Quaker MOP UP – Job Estimate Benefits

MOP UP Methodology:

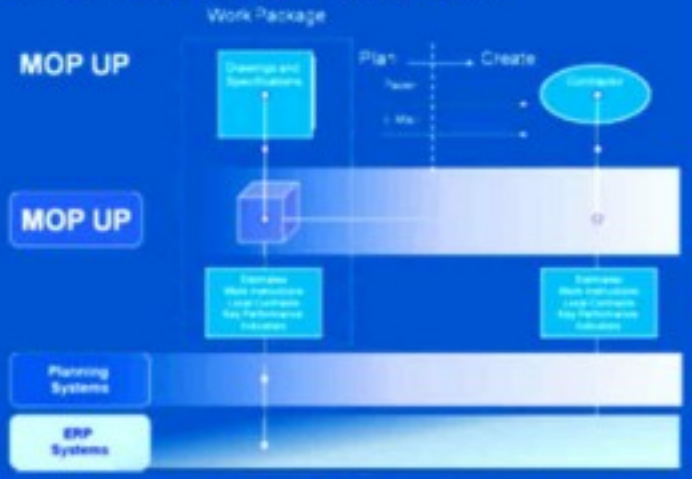
- Provides A Transparent Data Set Accessible As Defined For All Project And Job Data:
  - Estimates
  - Crew Make-up / Crew Size
  - Work Packages (WBS)
  - Local / Regional Contracts
  - Selling Rates
  - Absolute Benchmarks
  - Key Performance Indicators

Incentives Include:

- Improved Communication
- Standardization
- Reduced Duplication Of Effort
- Improved Transparency And Accuracy
- Cost Clarity By Exception

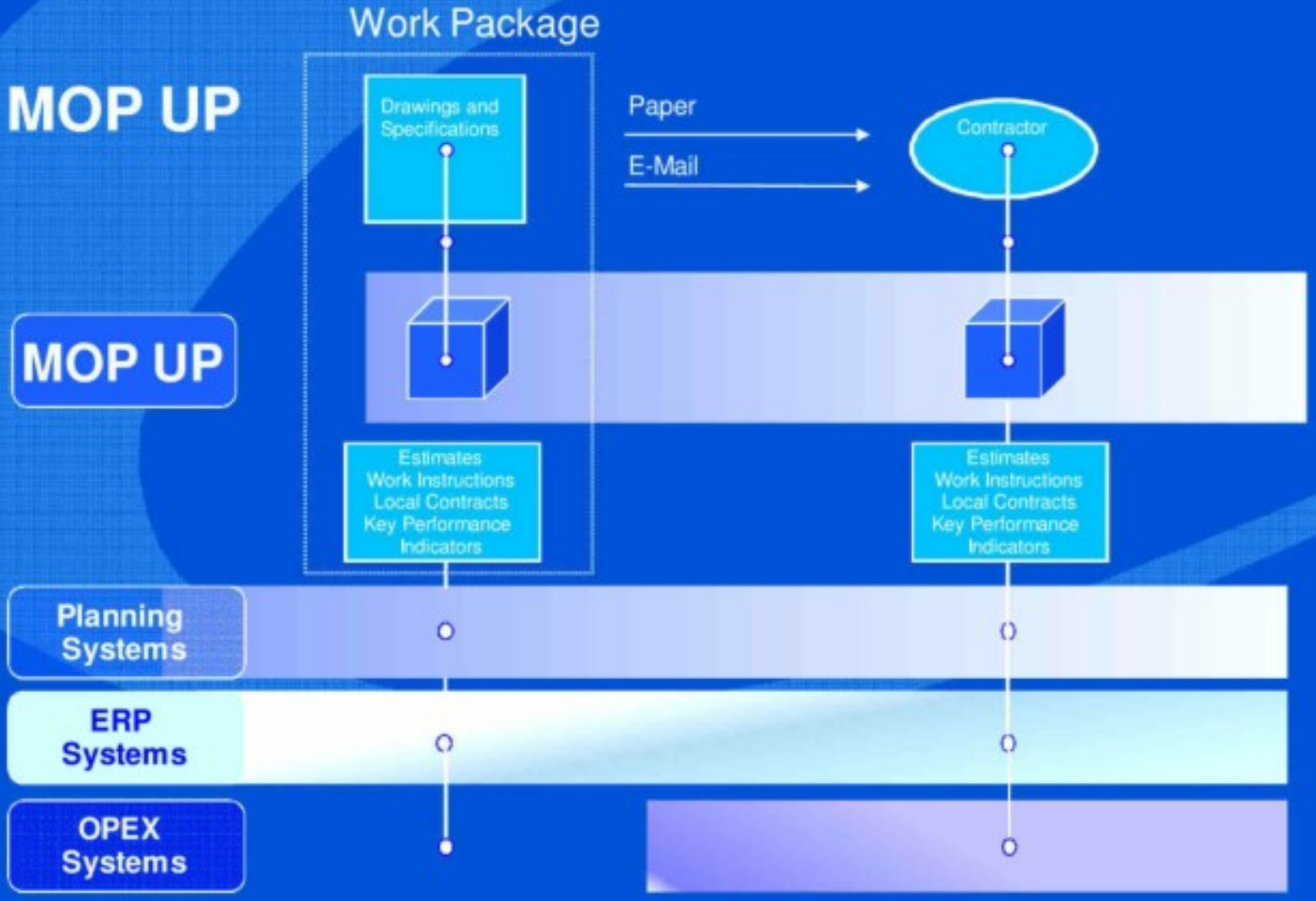
- Can Be Used For All Types Of Routine And CAPEX Work From Major Projects To Minor Maintenance Using A Pre-agreed Activity Based Contracts And KPI's

MOP UP Methodology – Create Phase



Unit Rate / Crew Make-Up Basis Estimate Detail

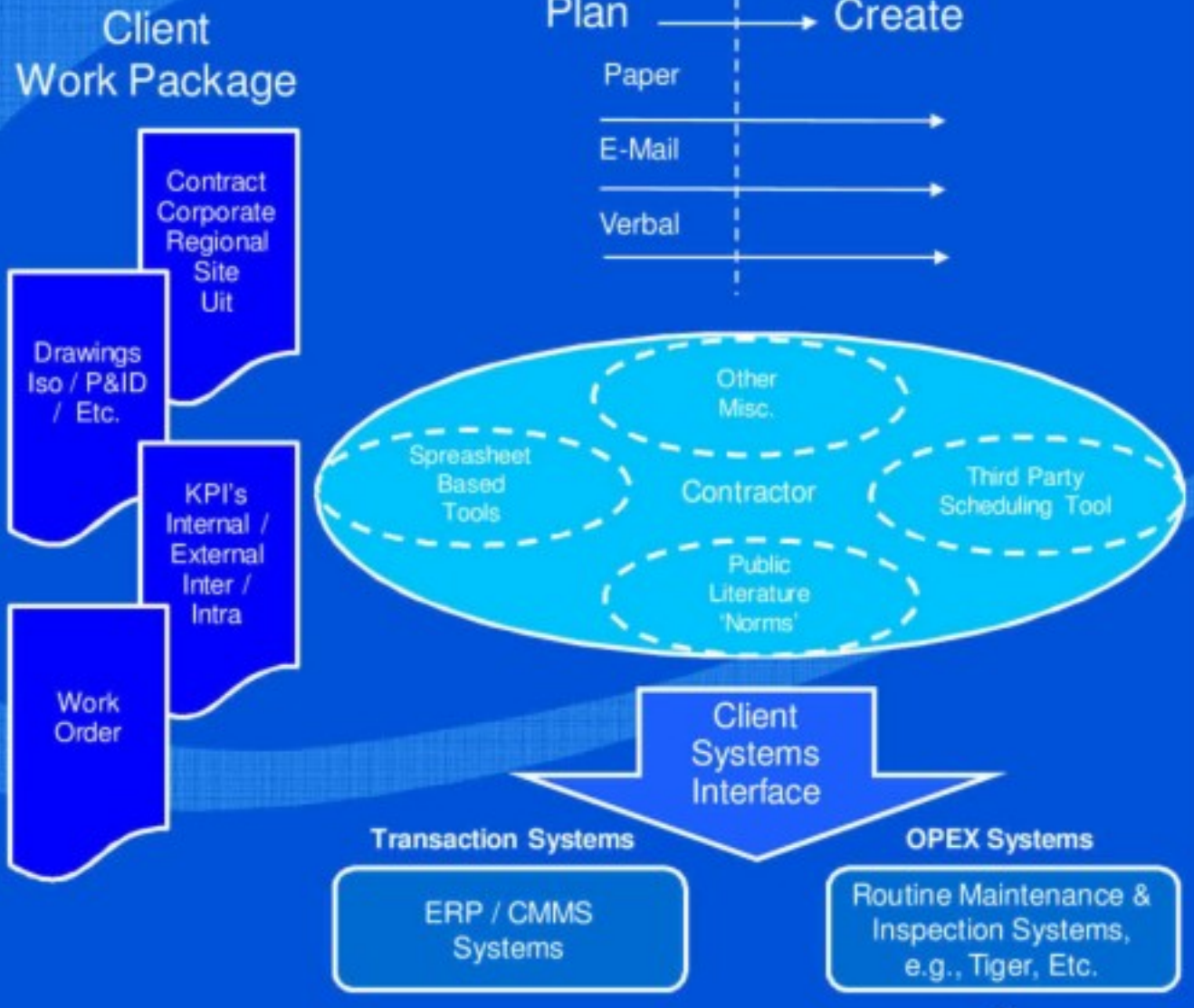
MOP UP Methodology – Operate Phase



Legacy Contract Management Methodology – Operate Phase

Legacy Contract Operate Process

- Same Issues As For The Legacy Approach To The Create Phase
- The Work Packages And Instructions Are Smaller And More Numerous Providing
- More Opportunity For Gains In Efficiency Of Process
- Standardized Work Crew Size / Make-up
- Standradized Sheduling And Execution
- Heurisitc Capabiity To Futher Develop Site-specific KPI's For Routine And Project Activities

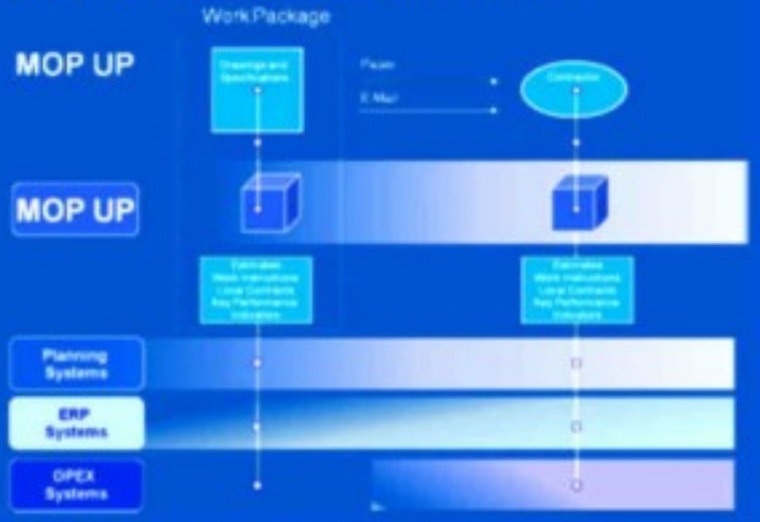


MOP UP Approach – Operate Phase

MOP UP Approach:

- Provides The Same Benefits As The Create Phase
- Other Benefits Include:
  - MOP UP Contract KPI's Incent Improved Contractor Performance
  - Improvements in standardizing Work Packages 9Crew Size, Etc.) And The Monitoring And Payment For Work Completed.
  - Client / Systems Interfaces Enable Improved Transparency And Efficiency, e.g., Authorization And Payment For Work Completed Per Contract Terms.

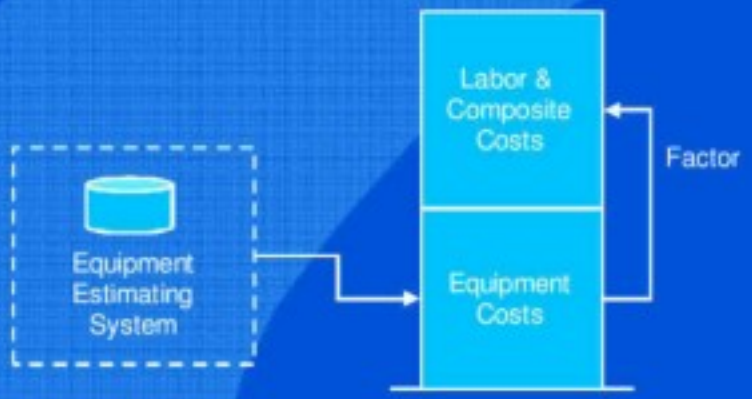
MOP UP Methodology – Operate Phase



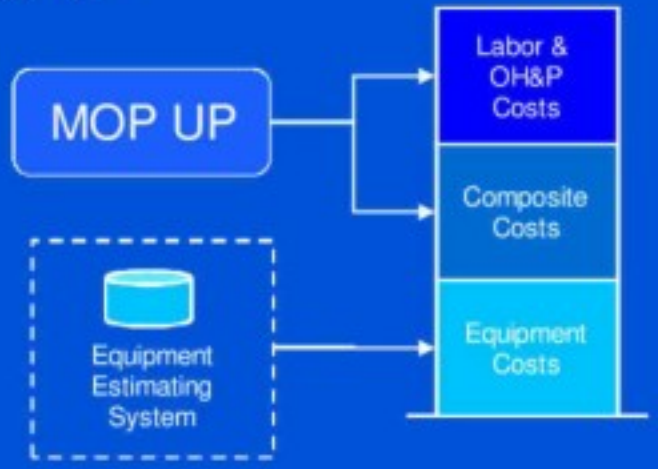
Unit Rate / Crew Make-Up Basis Estimate Detail

Work Estimate Breakdown – Legacy Compared to MOP UP

Legacy



MOP UP



Legacy Approach:

- Estimate Built Upon Knowledge Of Equipment Packages And Using A "Factor" To Estimate The Composite Materials And Labor Costs
- Reduced Accuracy And Certainty Due To Limited Knowledge Of True Composite Costs And Labor Costs
- Overhead And Profit (OH&P) Hidden And Not Recognized Within The Estimate
- No Consistency of Allocated OH&P between or among sites or regions or contractors

MOP UP Approach:

- Equipment Cost Estimate Still Based Upon The Knowledge Of The Equipment Packages, But The True Composite Materials Costs And Labor (Including OHP) More Accurately Estimated Through MOP UP
- Estimates For Non-equipment Costs Not Based On A Fudge "Factor" Ensuring Improved Accuracy Of Estimate
- MOP UP Separates Composite Materials Costs, Labor Costs, And OH&P, Ensuring Increased Transparency And Improved Accuracy Of Estimate
- Provides A Common Approach For All Parties Reducing "Surprises" And Reducing Client Risks Associated With The Final Estimates

MOP UP Local Site Implementation

MOP UP

Readiness Review

Systems

Processes

Competency

Gap analysis & Implementation Plan

System Configuration

User Configuration

System Interface Configuration

User Training & Support

Ongoing Support

Readiness Assessment

Full Implementation Plan

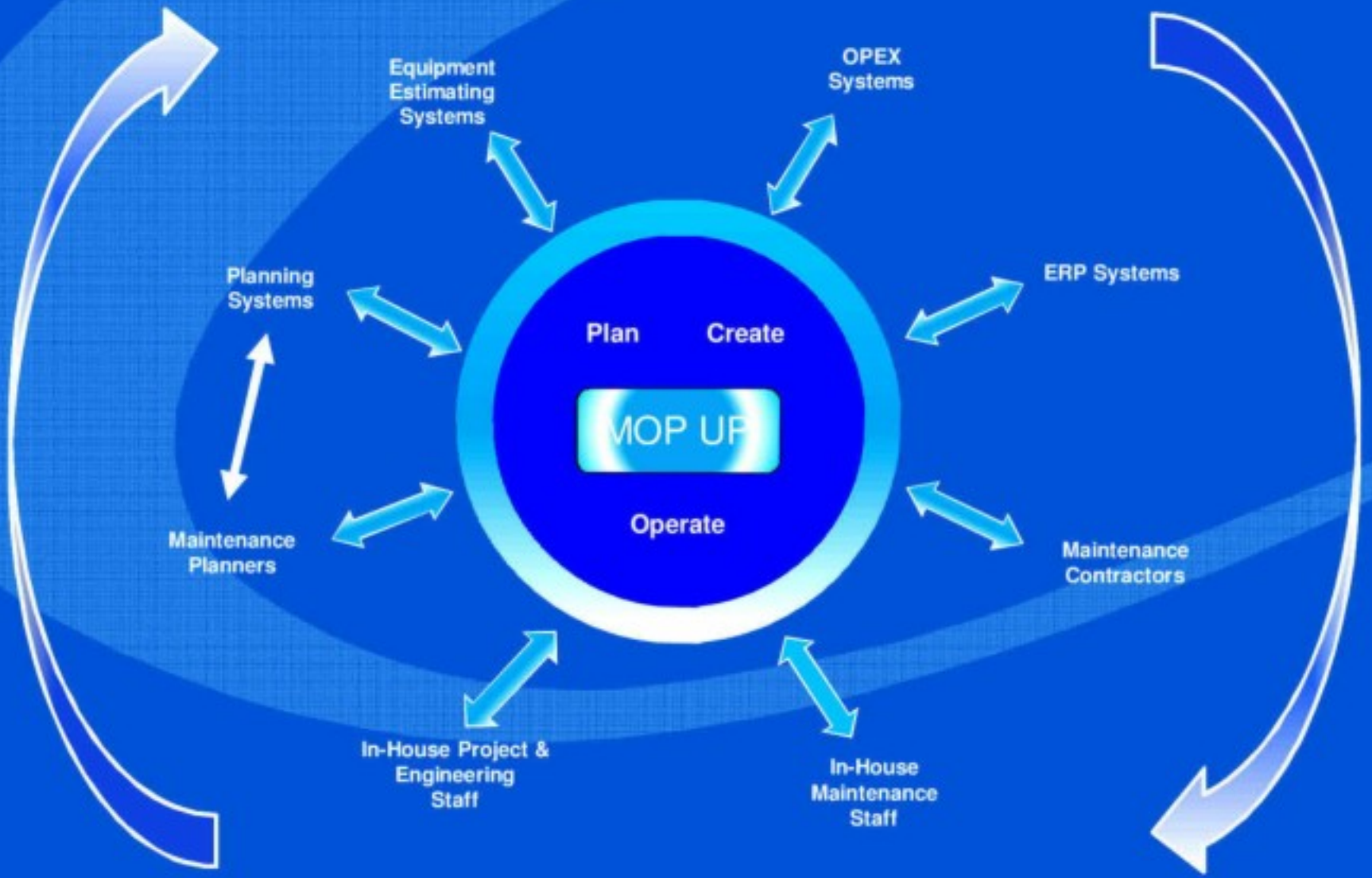
Site KPI Analysis

Fully Customized & Configured System

User Manuals, Training Materials, Level 1,2,3 Support

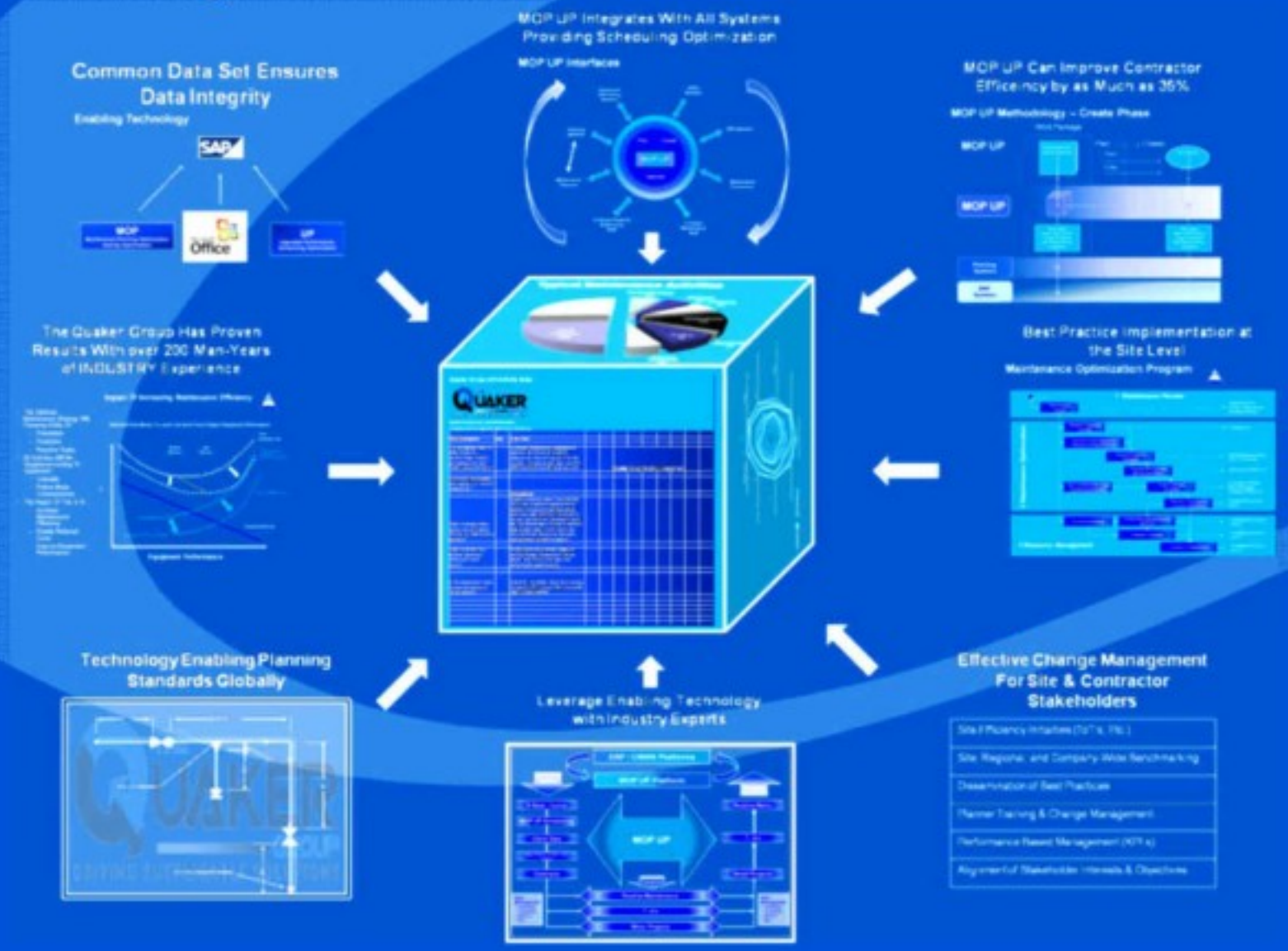
Preparation → Implementation → Support

MOP UP Interfaces



Quaker Group Maintenance Performance Improvement Productivity Discussion

Solution – Unit Rate Productivity: Craft Management



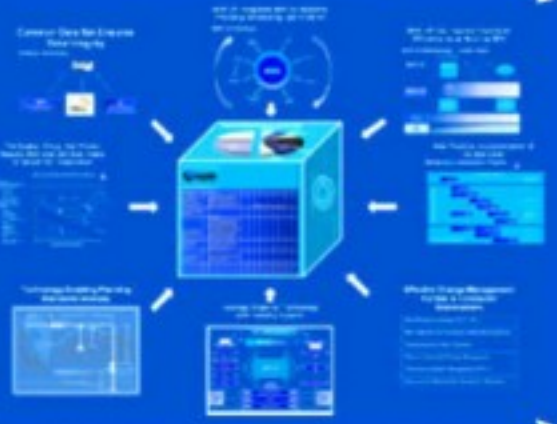
Solution – Unit Rate Productivity: Craft Management

Client Benefits

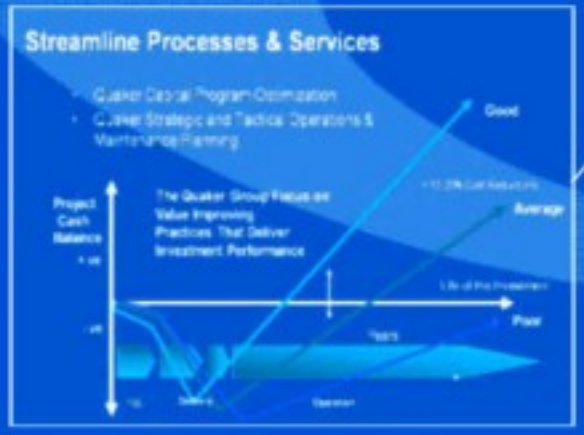
Institutional Knowledge

Quaker Group Spend Map
"As Is – To Be" Gap Analysis

Continuous Improvement Process



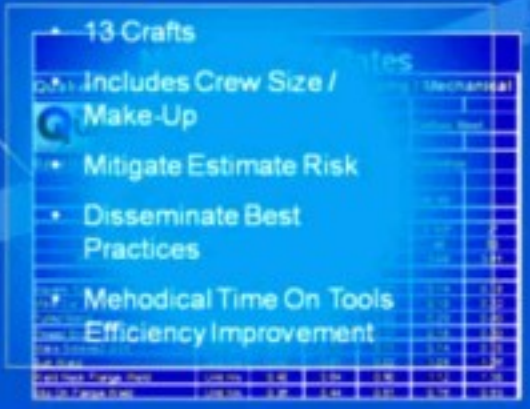
MOP UP Transactional Web - Based Platform Solution



Transparent Corporate Contract

Industry Specific Unit Rates For All Disciplines

Unit Rate Planning, Scheduling And Contracting



The Benefits Of MOP UP

MOP UP:

- Supports Knowledge Growth And Bench-marking Of Project And Contractor Performance
- Provides A Uniform Platform For All Stakeholders, Ensuring Improved Accuracy For Capex & Opex
- Improves The Efficiency Of The Estimating And Procurement Process Through The Provision Of A Unified Platform
- Enables Evergreen Improvements Via Heuristic Functionality
- Enables Clients To Review Their Contractor Relationships Based Upon Improved Transparency Regarding Of Cost And Risk
- Supports Accurate Benchmarking And Validation Of Estimates
- Provides a Scheduling Optimization Functionality with Full Integration

MOP UP Contract OptimizationTechnology

- MOP UP Has Been Designed On The Latest Microsoft ASP.NET Technology, Using C+++ Language And Sequel Server 2010 Databases.
- MOP UP Is Fully Secure And Is Only Available From Specific Computers Or Fixed IP Addresses.
- SSI Certificates Have Been Applied As Extra Security.
- All System Data Is Fully Encrypted.
- Log On To MOP UP Is Controlled By A Username & Password.
- MOP UP Has Multi-Language Capability, With The Language Settings Being Automatically Picked From The Computer And The User Profile.
- MOP UP Can Be Hosted And Accessed From Anywhere In The World With Internet Access.

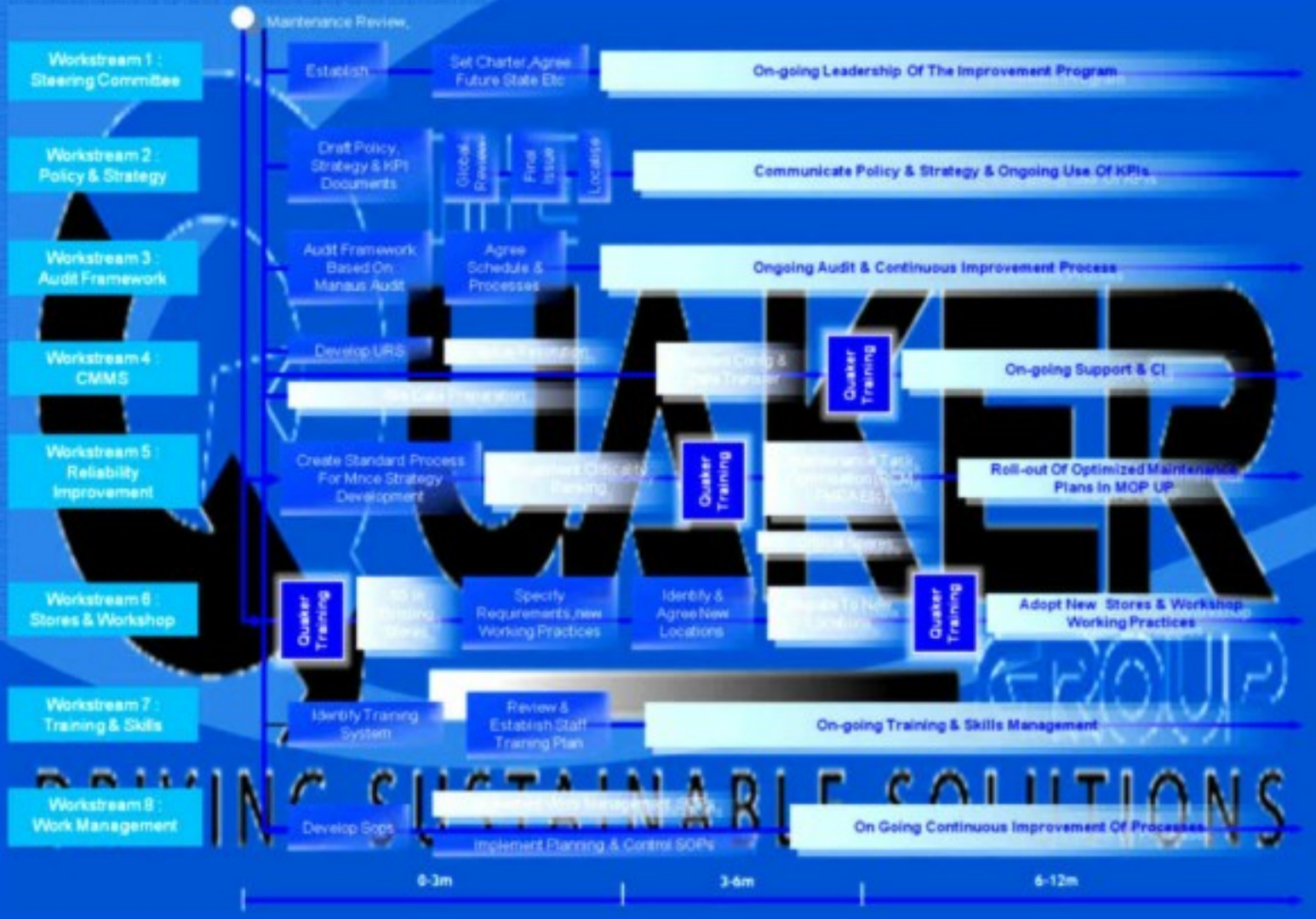
Success Factors

- Scoping Study To Identify Business & Engineering Requirements
- System Design & Configuration To Meet Requirements
- Clear Focus On Ultimate Objectives And Delivery Of Real Benefits
- Focus On KPIs & Return On Investment
- Integration Of Maintenance Process Improvement As Part Of The Project. E.g. Work Planning & Management, Stores Optimization, PM Frequency Optimization
- Project Team Comprised Top Down & Bottom-up Approach
- Configuration Of User-Friendly System
  - An Aide To Day To Day Working, Not A Hindrance
  - Evergreen process
  - Heuristic Capability

Practical Issues Associated With Maintenance Management Systems

- CMMS Not Delivering Against Maintenance Strategy / Objectives
  - Seen As A Cost Not A Benefit
- Lack Of Clear Measures Of Maintenance And Of CMMS Performance
- CMMS Acting As A Record Of 'What Has Been Done' But Not As A Live And Dynamic Tool To Manage Plant And Workforce
  - KPI's
  - Benchmarks
  - Scheduling (Heuristics)
  - Crew Make-Up / Size
- System Not User-friendly
- Asset / Inspection Records Incomplete Or Inaccurate
- Lack Of Ownership Of Maintenance IT
- Integration of Planning, e.g., CMMS, and Scheduling, e.g., Primavera, Systems

Overview: Upgraded Performance Solution (UP)



Quaker Group Technical Services

The Quaker Group Can Either Educate And Train Staff To Complete These Activities Themselves Or Provide Resources To Assist In The Following Technical Areas:

- Arm Analysis – Availability, Reliability, And Maintainability Analysis Completed As Part Of Improvement Programs For Employed Capital
- FMECA And RCA – Failure Mode, Effects, And Criticality Analysis, And Root Cause Analysis
- TPM And OEE – Total Productive Maintenance (Continuous Improvement Techniques, Autonomous Maintenance, Etc.) And The Implementation And Use Of Overall Equipment Effectiveness
- Asset Verification – Where A Client Has A Large And Diverse Asset Base We Assist Them With The Verification Of The Physical Assets And The Subsequent Population Of The Asset Information Within The ERP / CMMS System.
- Condition Monitoring – Working With Technology Partners We Are Able To Provide Fully Outsourced Condition Monitoring Services That Utilize Advance Web-delivery Systems To Ensure Up To The Minute Information Display.

Issues Associated With Maintenance Management Systems

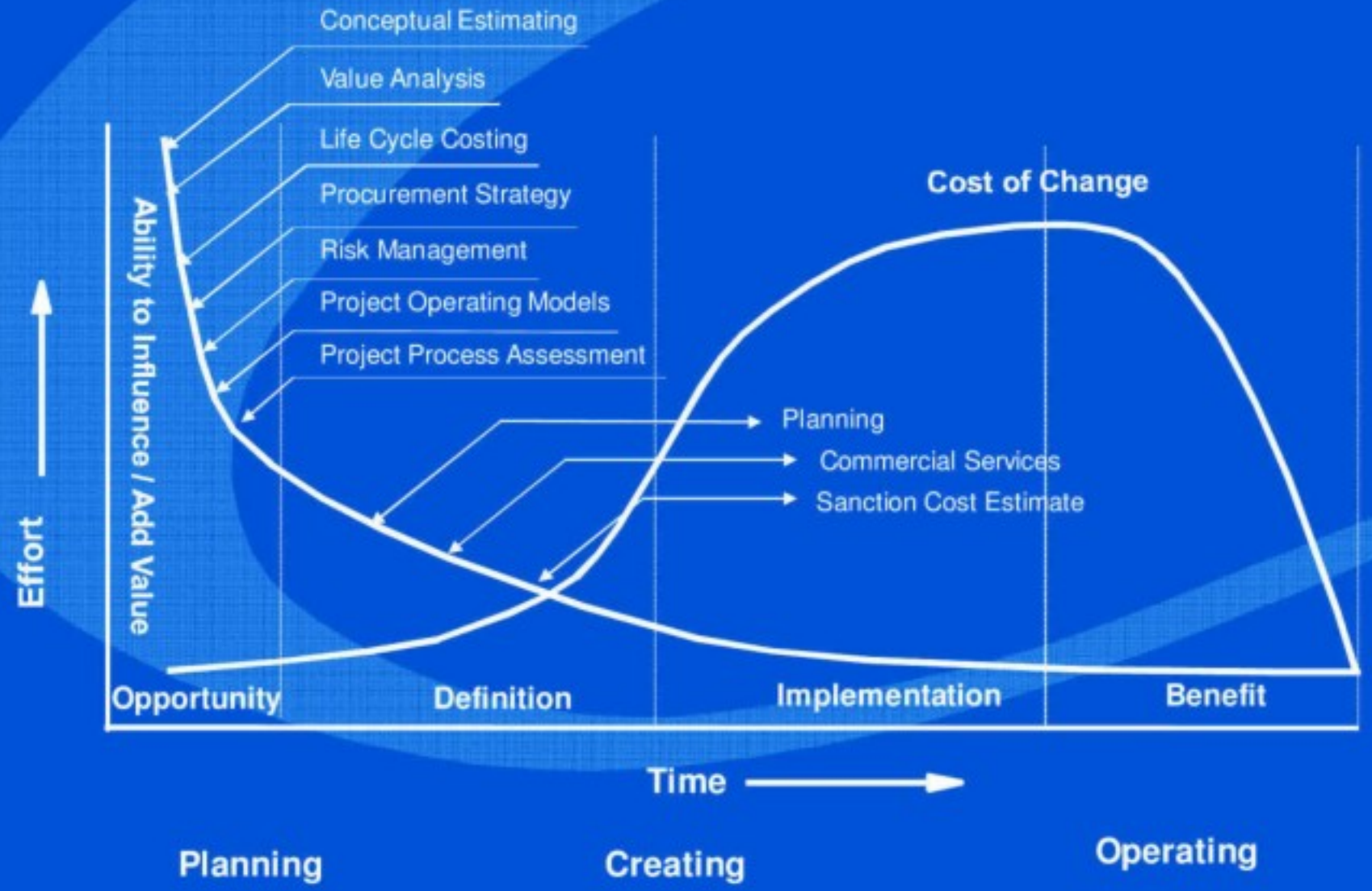
- CMMS Not Delivering Against Maintenance Strategy / Objectives
  - Seen As A Cost Not A Benefit
- Lack Of Clear Measures Of Maintenance And Of CMMS Performance
- CMMS Acting As A Record Of 'What Has Been Done
  - Not As A Live And Dynamic Tool To Manage Plant And Workforce And Improve Performance
- System Not User-friendly
- Asset Register Incomplete Or Inaccurate
- Engineering Analyses Don't End Up In CMMS E.g. RCM, RBI Etc
- Lack Of Ownership Of Maintenance IT

Unit Rates & Unit Rate Contracts

Unit Rates & Unit Rate Contracts

- Unit Rate Description
- Changes From ‘As-Is’ to ‘To-Be’
- Incentives & Gap Analysis
- Implementation & Change Management

Explicit Focus Adds Value



Unit Rate Contracts

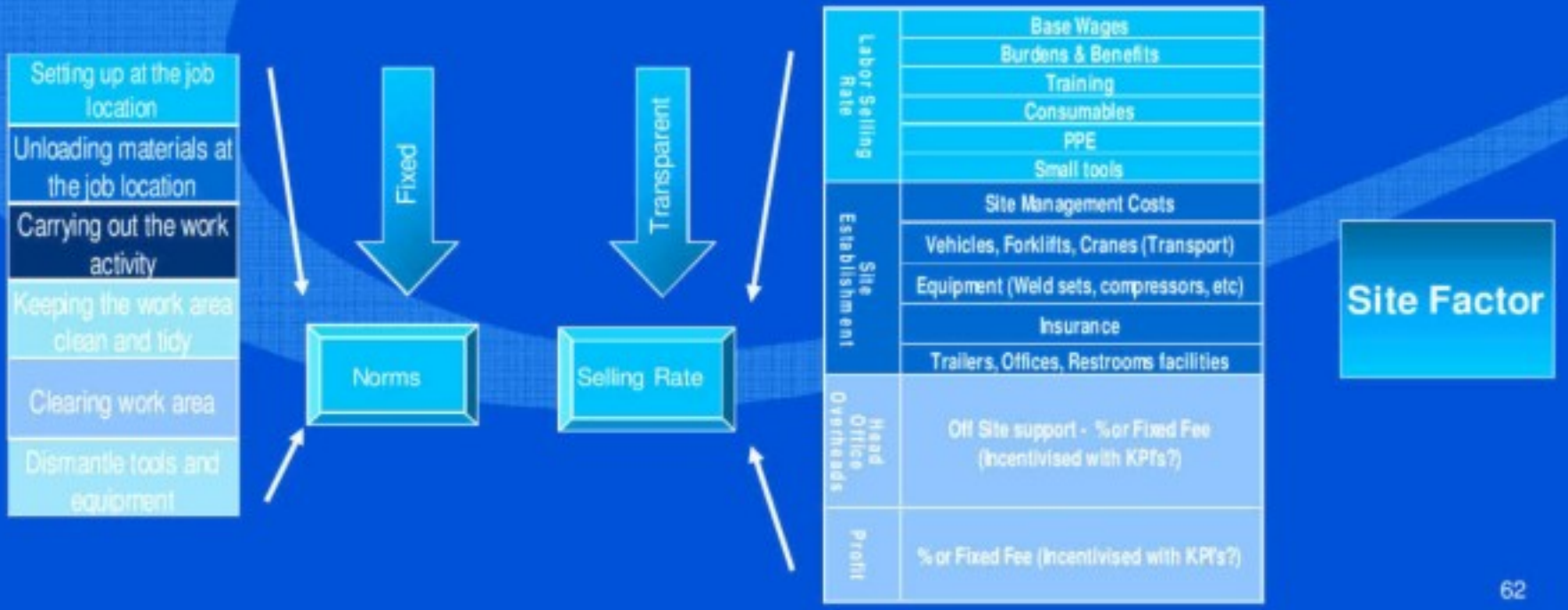
- Contractually fix times to complete activities
- Not estimates but fixed prices
- Highlight inefficiencies / areas for opportunity / improvement
- T&M bidding misleading
  - Lowest wage wins
  - Unit rate bidding allows for lowest wage & productivity factor wins
- Effective implementation requires active change / continuous improvement processes

Unit Rate Contracts

Norms / Unit Rates

A Norm Is An Allowance Of Time For A Group Of Workers To Complete A Specified Work Activity: Build A Scaffold, Pre-fabricate Piping, Erect Piping.

Time (Hrs) X Selling Rate X Productivity Or Site Factor = Price



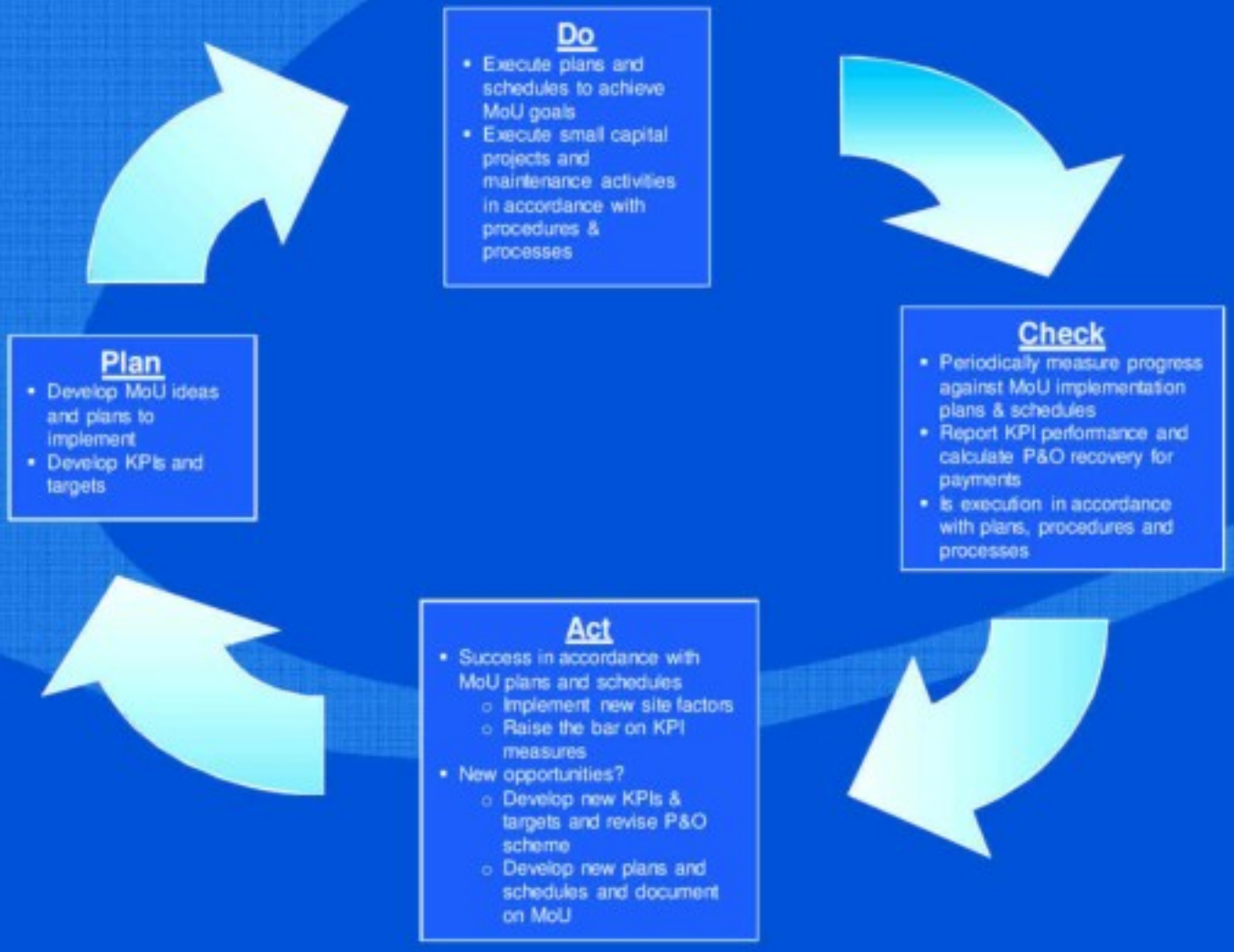
Unit Rate Contracts

The Changes Are More Than Just Adding Unit Rates

- Price Not An Estimate
- Active Contract Management
  - Fee at Risk
    - Based On Meeting / Exceeding Mutually Agreed Upon Targets
  - Continuous Improvement
    - Finding Inefficiencies And Exploiting (MOU Process)
- Cost Transparency
- Regional Normalization

Unit Rate Contracts

Active Contract Management Model

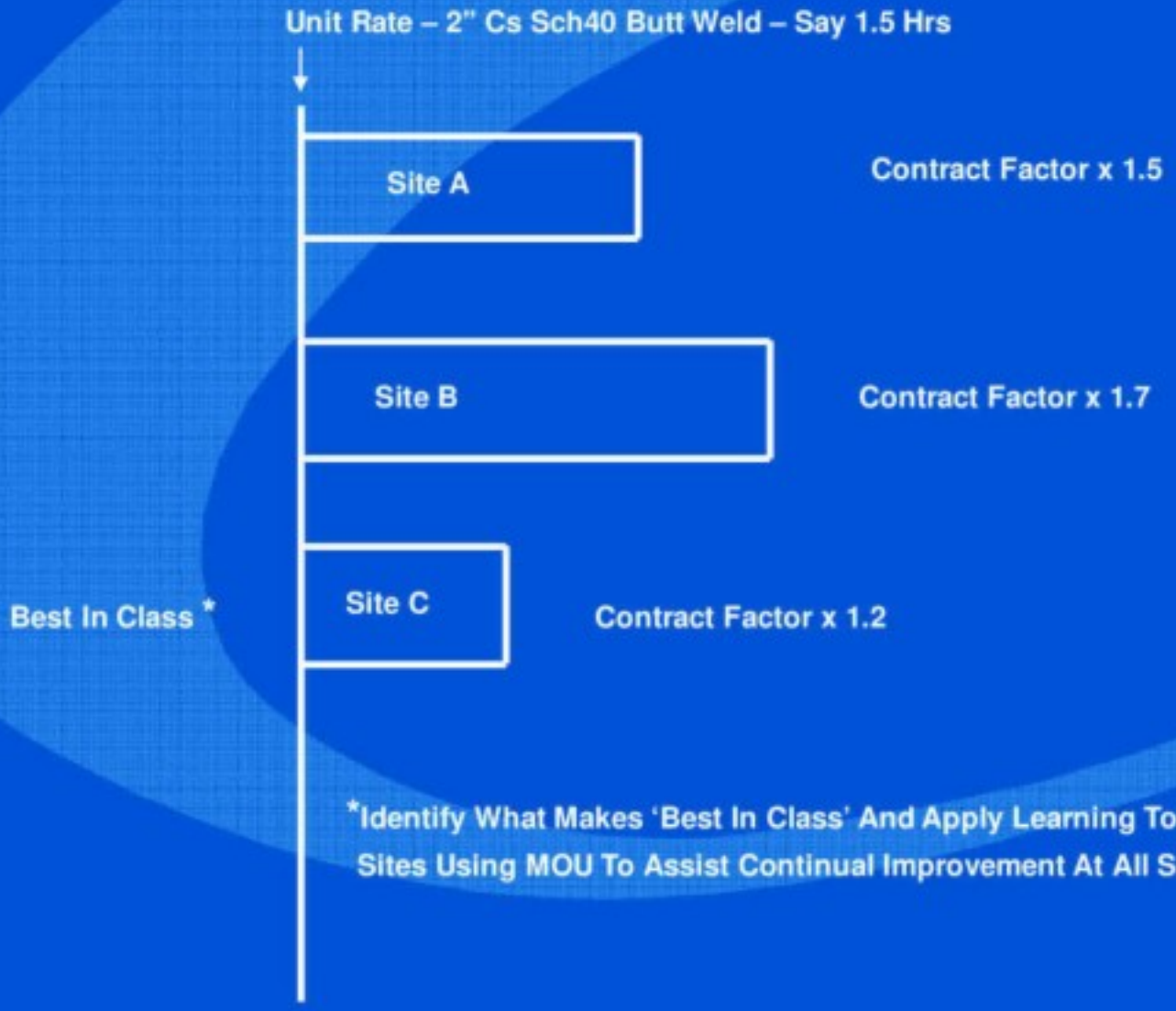


Unit Rate Contracts

Incentives for Change

- Typical Contract Formats In Place Generally
  - Misaligned Objectives
  - Do Not Drive Continuous Improvement
- Consistently Utilizing The Right Contract Form Can Yield Savings Of 10 – 25%
- Align Vendor Objectives With Company
  - Vendor Seeks Profit
    - T&M Mentality Is To Add Headcount
    - Unit Rate / KPI Tactic Is To Improve Efficiency
  - Owner / Operator Seeks Cost Management
- Shift From Transactional To Partner Relationship
  - Aligned Stakeholder Objectives
- Pay For Performance
- Proactively Drive Improvement

Unit Rate Incentives



*Identify What Makes 'Best In Class' And Apply Learning To Other Sites Using MOU To Assist Continual Improvement At All Sites

MOP UP Unit Rate Applications & Craft Representations

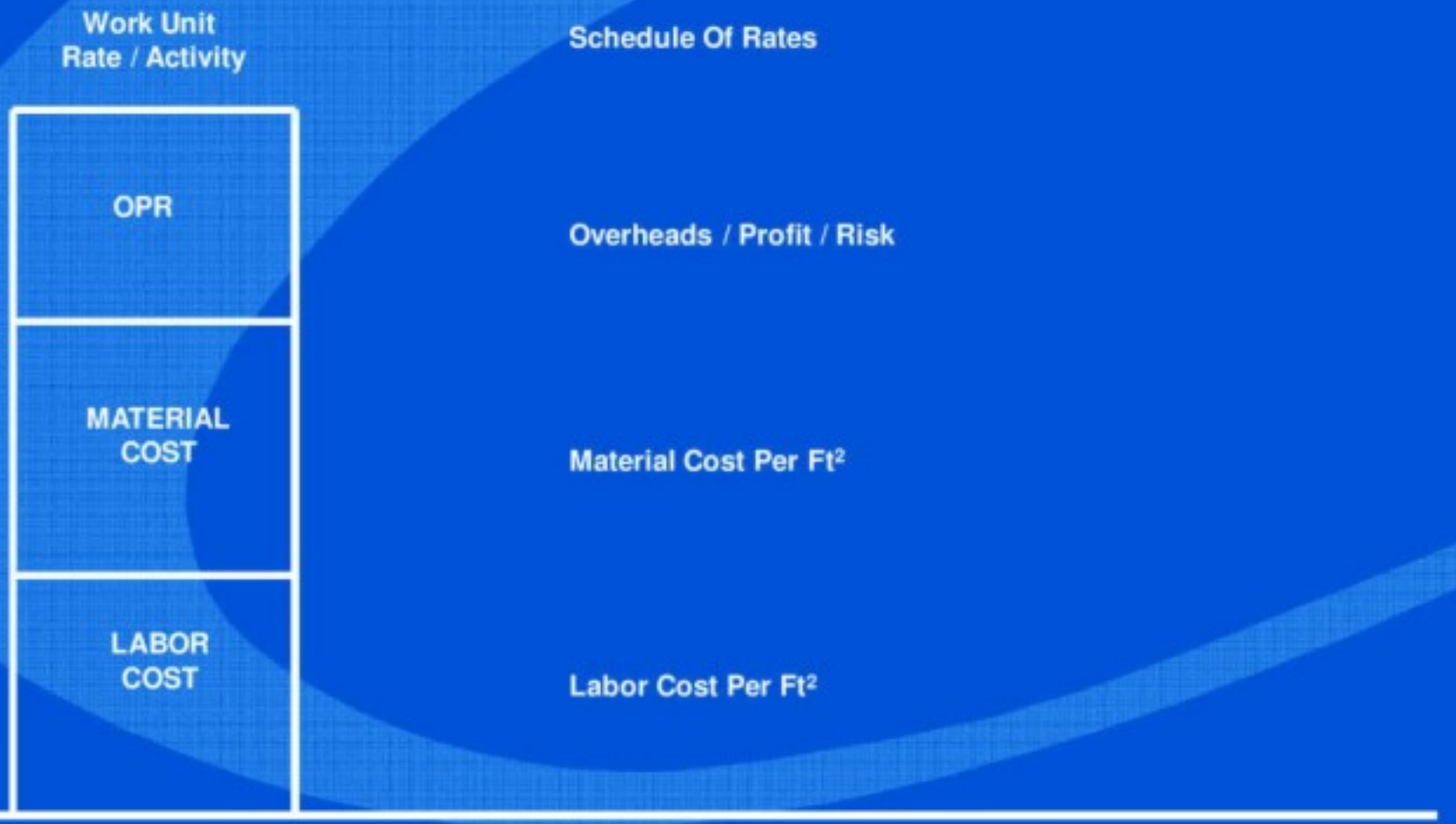
- Maintenance / Turnarounds / Projects
- Disciplines Covered
  - Mechanical Pipework
  - I & E
  - Scaffold
  - Insulation
  - Painting
  - Civil & Building
  - Steel Metal
  - Rotating Equipment
  - Static Equipment
  - Tankage
  - Industrial Cleaning

Unit Rates - Elements

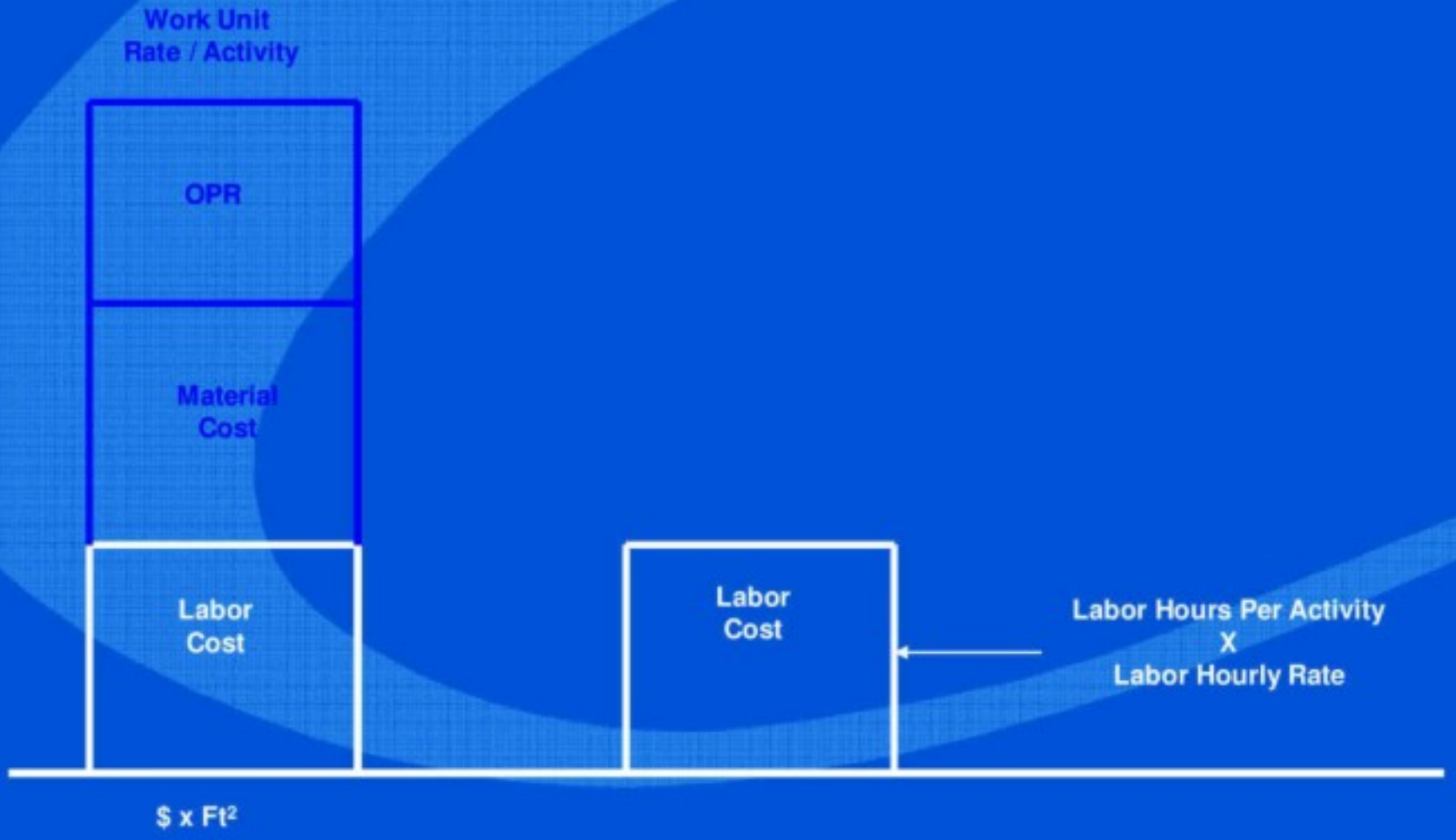
- Cover A Specific Labor Time Required To Complete A Defined Activity
- Use Standard Method Of Measurement For Consistency
- Published Unit Rates Have Been Done In Other Industries
  - In Europe By Quanitity Survyeors (QS)*
  - Unit Rate Publishers Include:
    - Page & Nation
    - Ocpca
    - Others
- All Contractors Globally Have Unit Rates To Allow Estimate Build Ups For All Pricing
- Contractros Use Unit Rates To Develop Estimates For All Work Independant Of Contract Type:
  - Lump Sum / Turnkey
  - Target Costs
  - Work Unit Rates / Schedule Of Rates

* QS is a UK function that provides 3rd party contract management services in the building construction industry. The function is a response to mitigate UK construction contract liability that requires 3rd party review of construction contracts. Typically the QS will work either for the contractor or the builder. Unit rates were developed many years ago as a simple tool for the QS to check and validate contracted rates versus actual to manage building construction contracts. A QS is not an engineer, lawyer, or purchasing agent, but has some elemental skills in each. The QS function is sparse in the petroleum industry and it is imperative to have any of these rates normalized for the industry with petroleum industry specialists familiar with the technical aspects of petroleum industry operting conditions, assets and processes, i,e., maintenance engineers & planners.

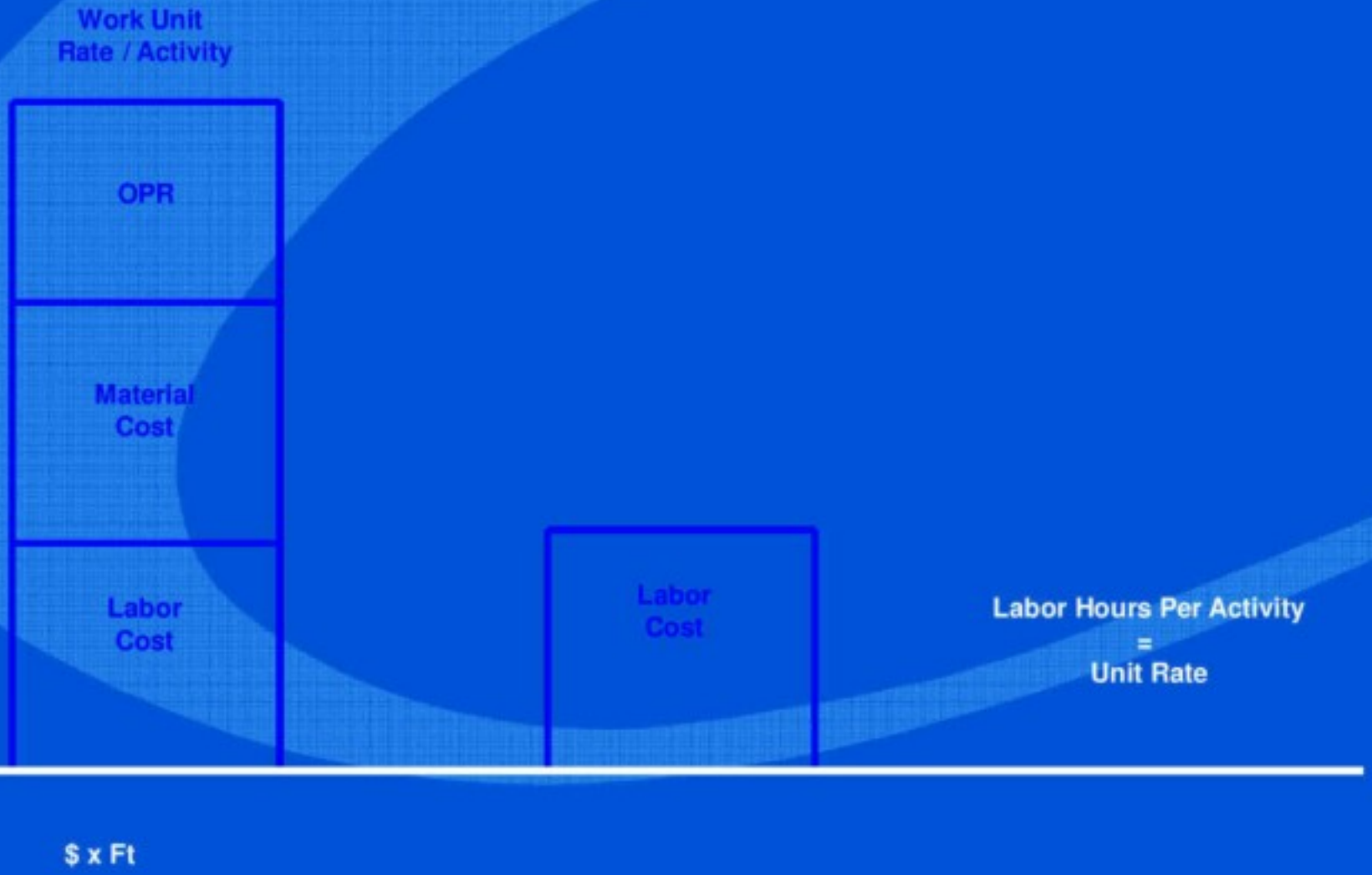
What is a Unit Rate ?



Unit Rate Components



Unit Rate Components



Unit Rate Components

Unit Rates Do Include

All The Work Described In The Contract To Complete The Activity:

- Setting Up At The Job Location
- Safety Permits & Transfer Time From Plant Sign In Point To The Work Area
- Setting Up Tools, Plant And Equipment
- Protecting Adjacent Areas
- Any Necessary Measurement

- Unloading Materials At The Job Location
  - Unloading Materials From Transport Parked Adjacent To The Place Of Work
  - Lifting Or Hoisting Materials Into Position, And All Rigging Activities For Lifting By Crane
- Carrying Out The Work Activity
- Keeping The Work Area Clean And Tidy
  - Collect Waste Materials And Rubbish. Place In Containers For Removal
- Clearing The Work Area Once Work Is Complete
  - Dismantle Tools And Equipment
  - Remove Any Protection

Unit Rates Do Not Include

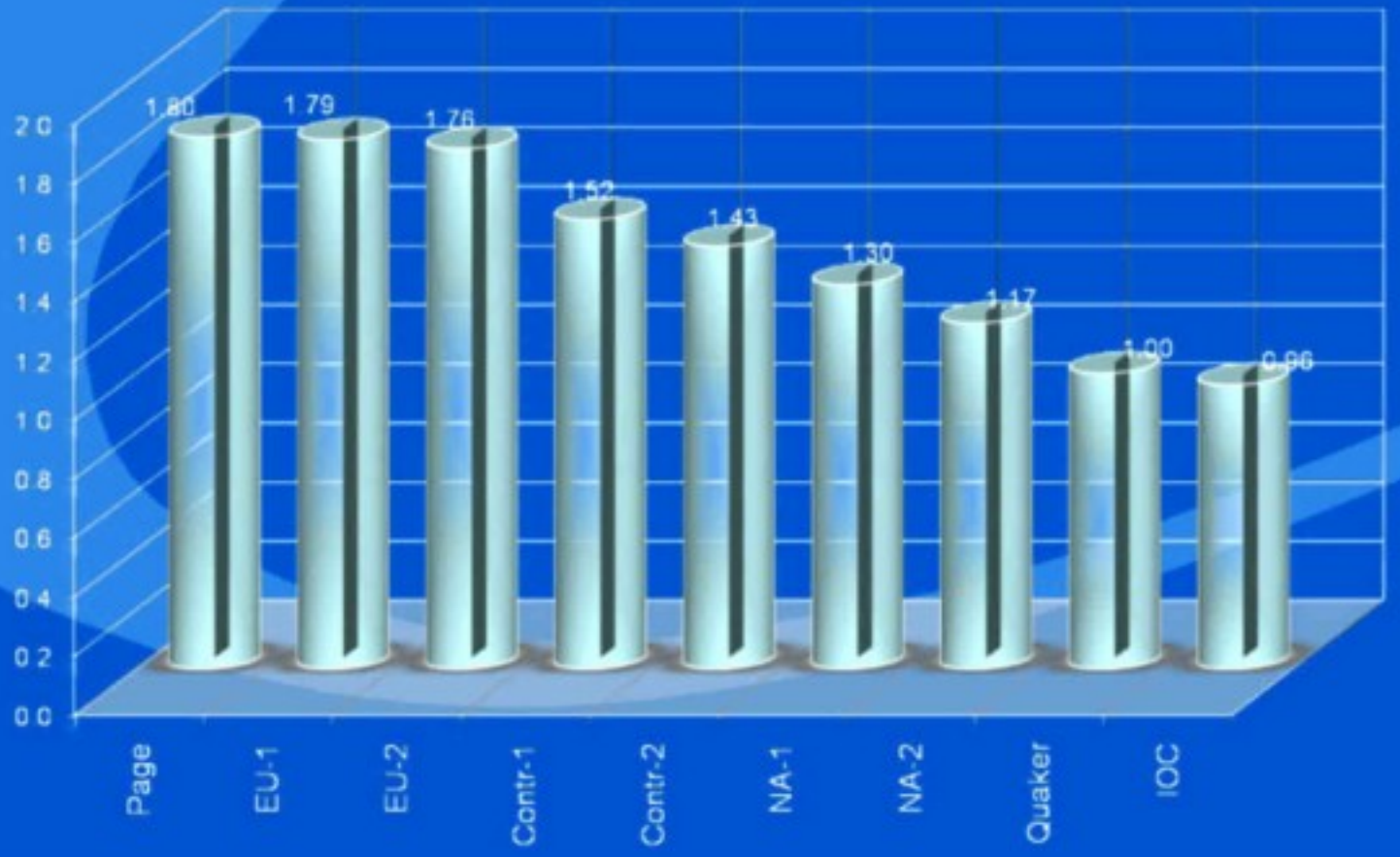
The Following Is Not Described InThe Contract And Is Excluded From The Unit Rates Are Activities Such As:

- Transportation From Stores To The Work Area Of :
  - Materials
  - Tools
  - Equipment Or Consumables
- Transfer Of Personnel Between The Contractors Facilities:
  - The Sign In Point
  - Including Obtaining Permits

  These Activities Differ Across Sites Due To:
  - Site Layout
  - Process Used,
  - Distance From Contractor Facility To Work Areas.
- The Time For These Activities Is Recovered Via A Contract Factor

Unit Rate Contracts

Why Change –
Relative Site Factor Piping Benchmark



Unit Rate Contracts

Quaker Unit Factor Evolution

- Initial Spot Readings For Selected Equipment In Refining North America (2003)
- Normalization Of Page & Nation Data For The Process Industries (2004)
- Page Data Internationalized For Americas And APAC (2005)
- Tine On Tools Measurement Methodology Standardized (2005)
- Kpi's Developed Using Base Unit Factor Data For Selected Crafts (2005)
- Spreadsheet System Generated To Steward Routine Maintenance Planner Performance (2006)
- Process Maps & Standards Generated For Routine Maintenance / T/A's And Small Projects (2006)
- Planner Training Program Formalized Using Unit Factor Spreadsheet Tracking (2008)
- Development Of Integrated KPI / Planner Performance Stewardship Program (2009)
- Fully Populated Unit Factors For All Crafts (2008)
  - Mechanical
  - Painting
  - Piping
  - Civil
  - Scaffolding
  - Shops
  - Etc.
- Development Of Scheduling Capability Bundled With Unit Factor KPI's (Current)
- Co-development With River Logic On Bundled Scheduling / Planning Offering With Heuristics Functionality (In-Progress)

Unit Rate Contracts

Characteristics

- Contract Management Plan Development
  - Short-term Planning, Execution, Measurement And Action Plans
    - Implement Monthly Performance Reviews
    - KPI Tracking / P&O At Risk
  - Long-term Planning, Execution, Measurement, And Action Plans
    - Efficiency Improvement
    - MOU
- New Roles
  - Business Guardian
  - Contract Holder

"We Cannot Expect A Different Result If We Don't Approach The Work Differently - If We Think Otherwise We're Foolish" *

* Quaker Group Partner Quote

Web Based Software Support
Platform (Internal & External)

Asset Maintenance Optimizer IT Systems Description:

Unit Rate & Work Scheduling Software

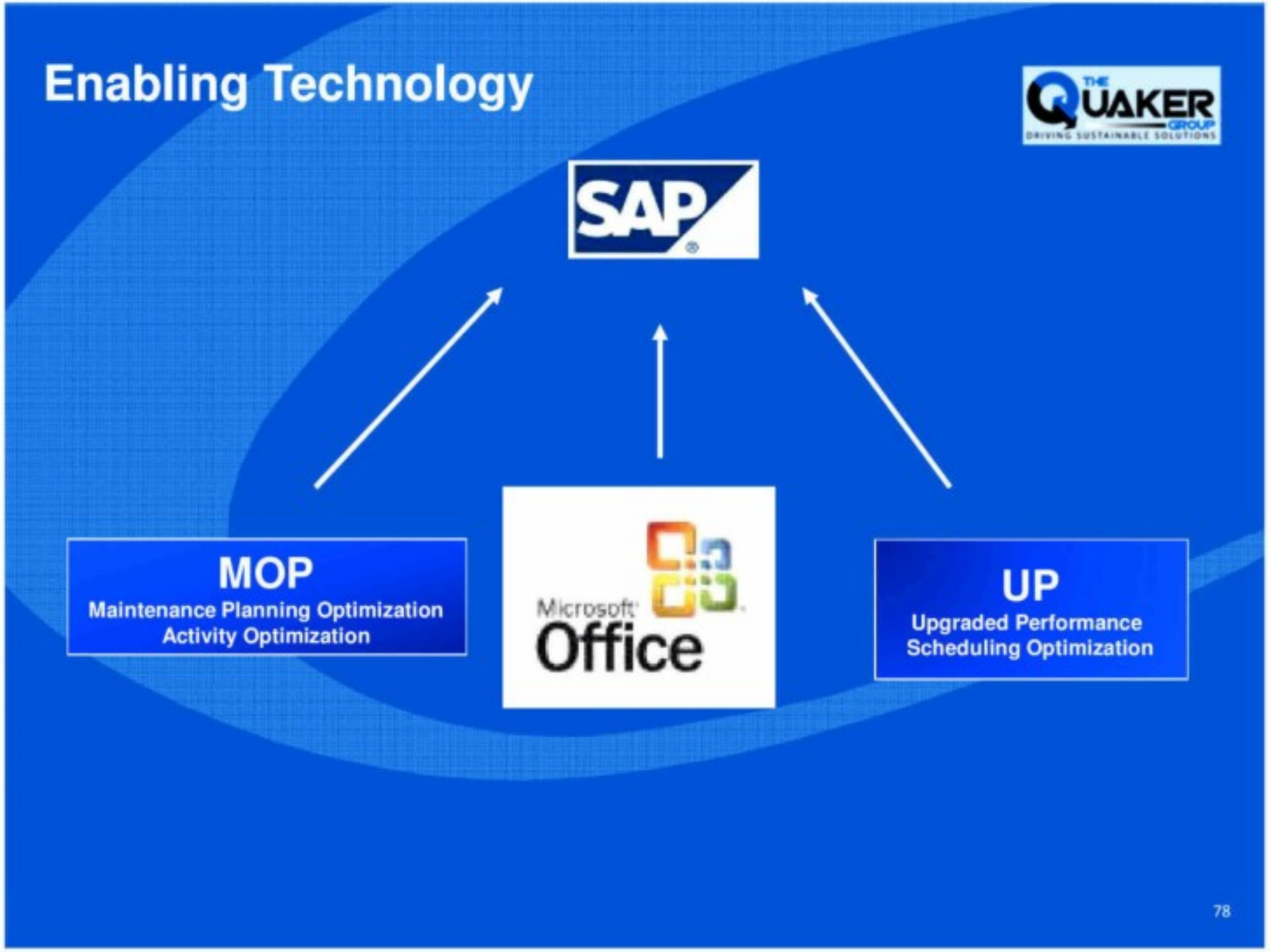
MOP UP Solution

Maintenance Optimization Planning &

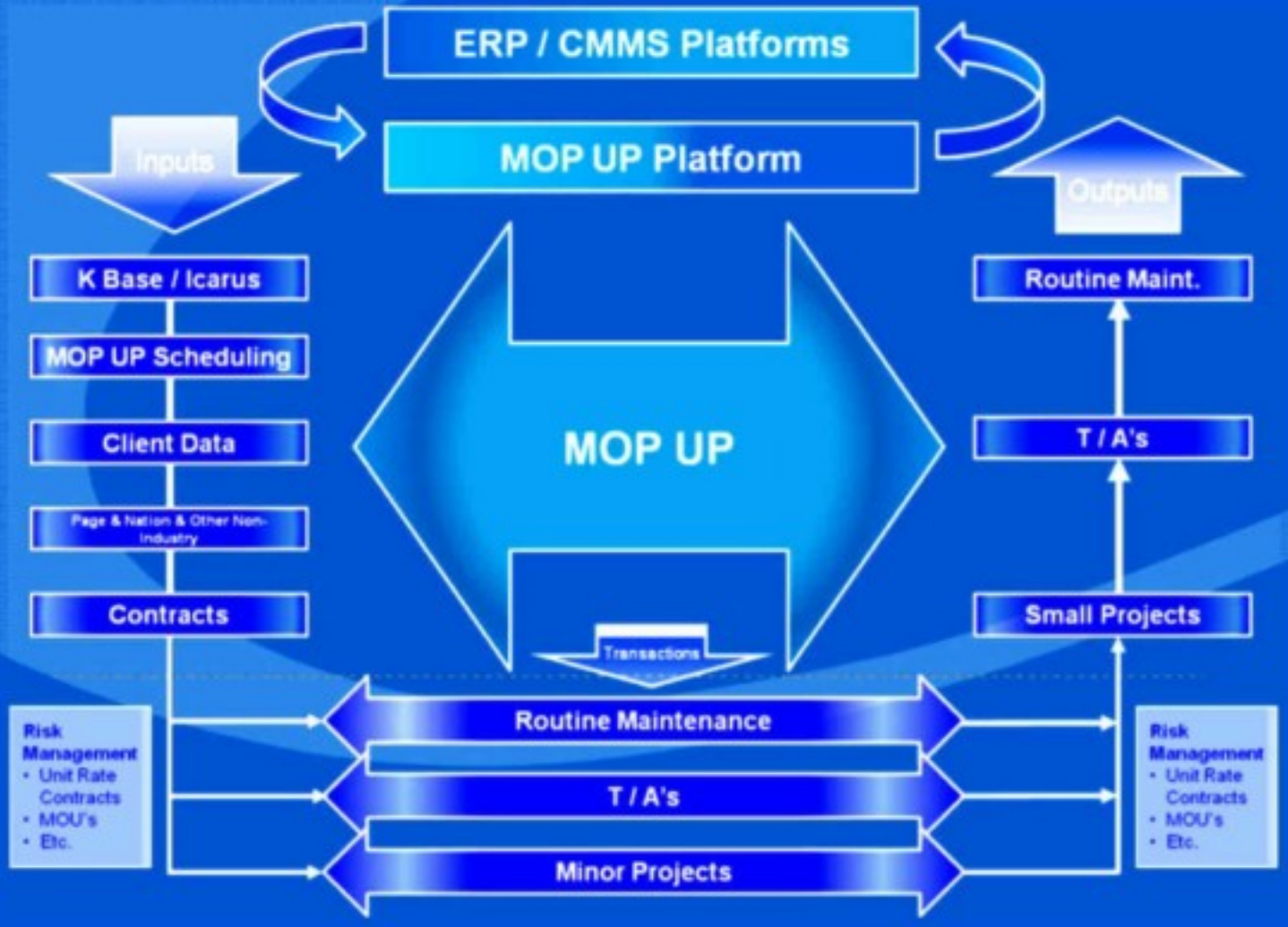
Upgraded Performance

A Technology Component Of The Quaker Group's Maintenance Performance Improvement Program

Enabling Technology



MOP UP Architecture Schematic



MOP UP Software Functionality

MOP UP:

- Provides A Platform That Integrates With Other Best In Class Software Tools, To Manage The Costs And Risks Associated With An Investment Through The Asset Life-cycle (Plan, Operate, Maintain, Schedule And Execute).

- Provides Greater Transparency And Certainty For The Construction Materials And Labor Activities Of Small Or Large Maintenance Expense Or Capital Projects Via a Transparent Unit Rate (Activity) Basis.

- Ease Of Use And Legacy System Compatibility Enables Full Utilization By Owner / Operators And Contractors To Enhance Planning, Scheduling And Estimating Accuracy And Consistency

Integrated Maintenance Planning / Contracting Solution

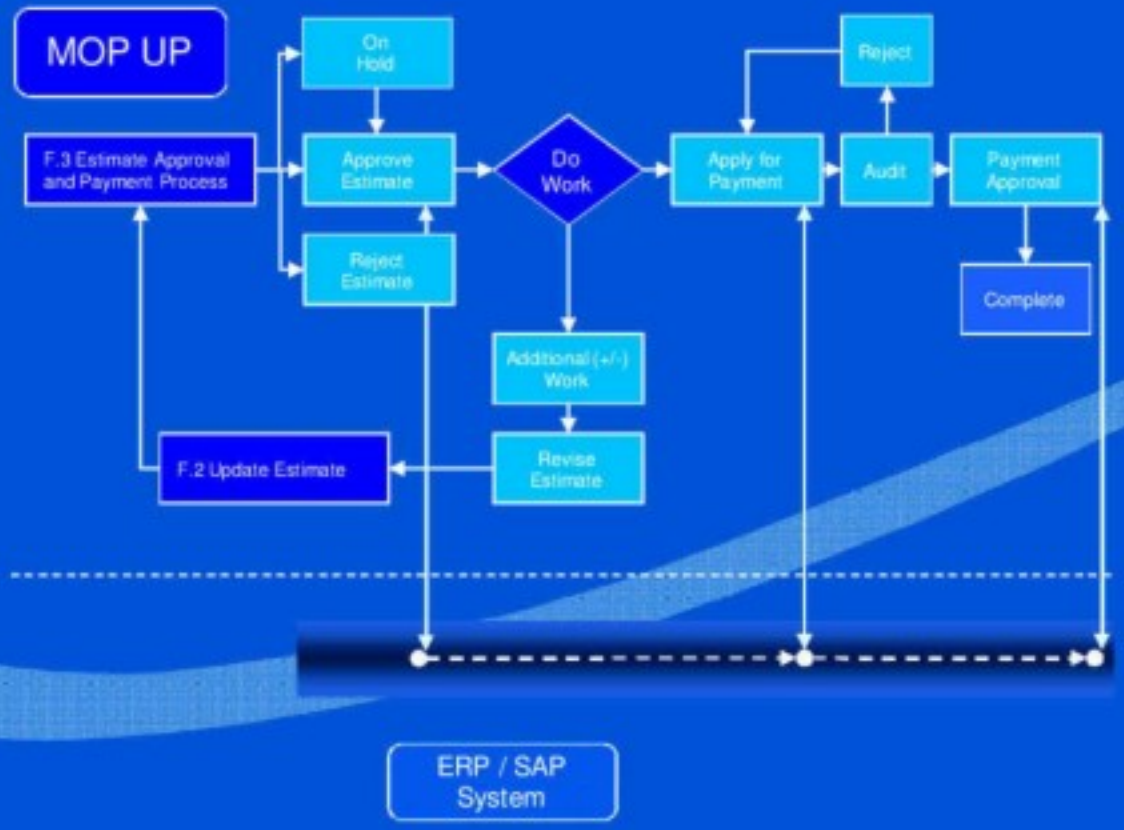
One Global Web Portal
For Control And Efficiency Gains

- Routine Maintenance
- T/A's
- Small Projects
- Regional Contract Bids
- Normalized Unit rates
- Transparency
- Regional & functional Scalability
- Planning KPI's
- Aligned Objectives

MOP UP Procurement and Transactions

MOP UP:

- Provides Full Control Over Estimate Approval.
- Interfaces With ERP and Other Point Systems.
- Controls And Ensures Payment Against Actual Approved Work.
- Allows for Audit Trail From Estimate Approval To Close Out.
- Variations Can Only Be Achieved Through Revisions To Estimates And Subsequent Approval Controls.
- Provides Cost Data For Subsequent Benchmarking And Cost Management.



MOP UP Functional View

THE QUAKER GROUP
DRIVING SUSTAINABLE SOLUTIONS

MOP UP

Objective Planning

Scheduling With Integrated Interface

Linked With Contract Management Systems

Enables Benchmarking and Reporting

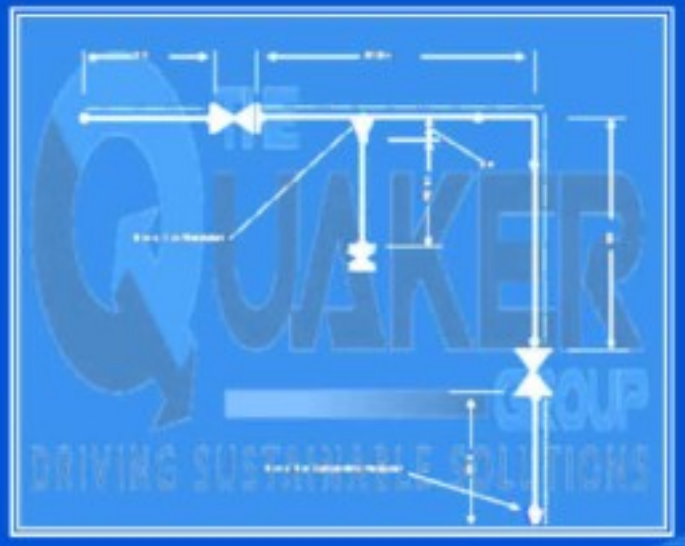
Overview: Upgraded Performance Solution (UP)

Maintenance Performance Processes

MOP UP Using Composites

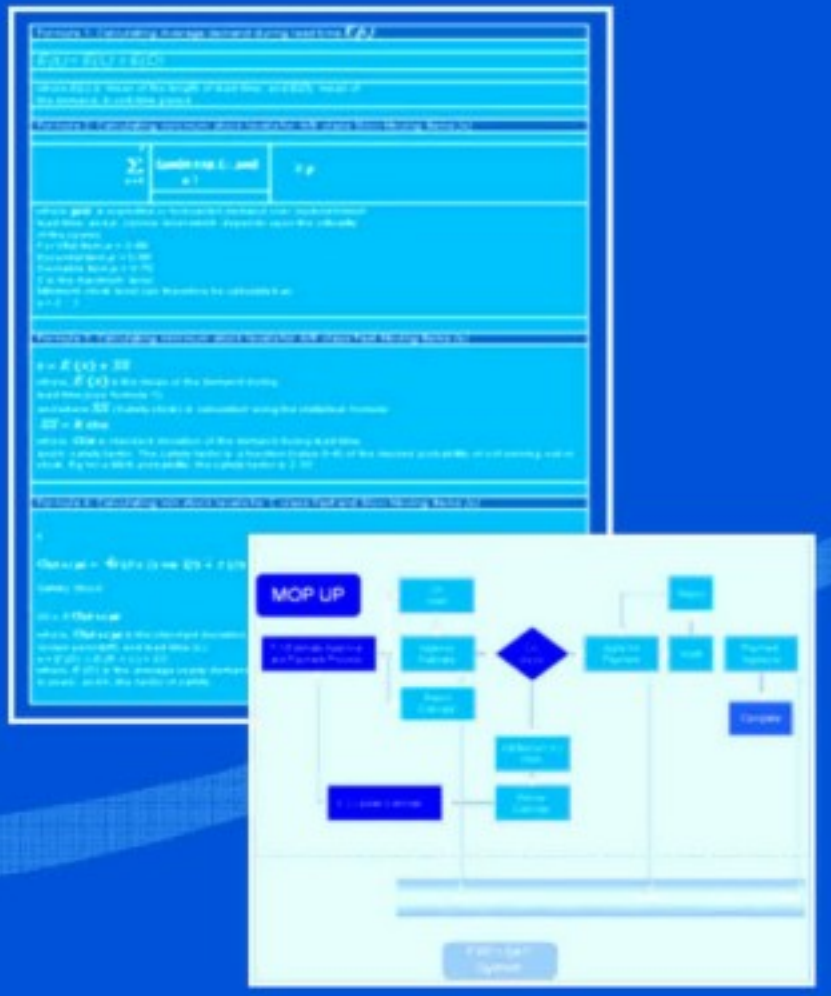
MOP UP:

- It Is Possible To Build Composite Estimates Based Upon Man-hour Norms And Composite Material Requirements.
- Any Estimates Can Be Saved As A Template And Re-used Enabling Efficiency And Accuracy Gains.
- Composites Can Be Created And “Normalized” To A Standard Unit Of Measure And Stored For Future Use.
- Users Can Rapidly Build Estimates Using Composites Through Multiplying The Estimate By The Required Unit Of Measurement.
- As The Composites Are Built From The Baseline Data Updating And Increasing Accuracy Is Simplified As Additional Detail Becomes Available.



MOP UP Support And Training

- MOP UP Is Fully Supported Through Level 1, Level 2, And Level 3 Support Arrangements.
- Mop Up Is Also Backed-up By A Full Set Of Training Modules And User Guides (Both Hard Copy And Via On-line Help).
- Local Super Users Are Trained To Provide Site / System Administration Function.
- The Quaker Group Can Provide A Fully Secure Hosted Solution.
- 24/7 Helpdesk From The North American Operations Center (NAOC) For Technical And Functional Support.
- Clients May Elect To Host Mop Up Locally Within Their Own System Architecture.
- Clients Can Be Trained To Provide In-house Mop Up Training Using The Module Training Materials.



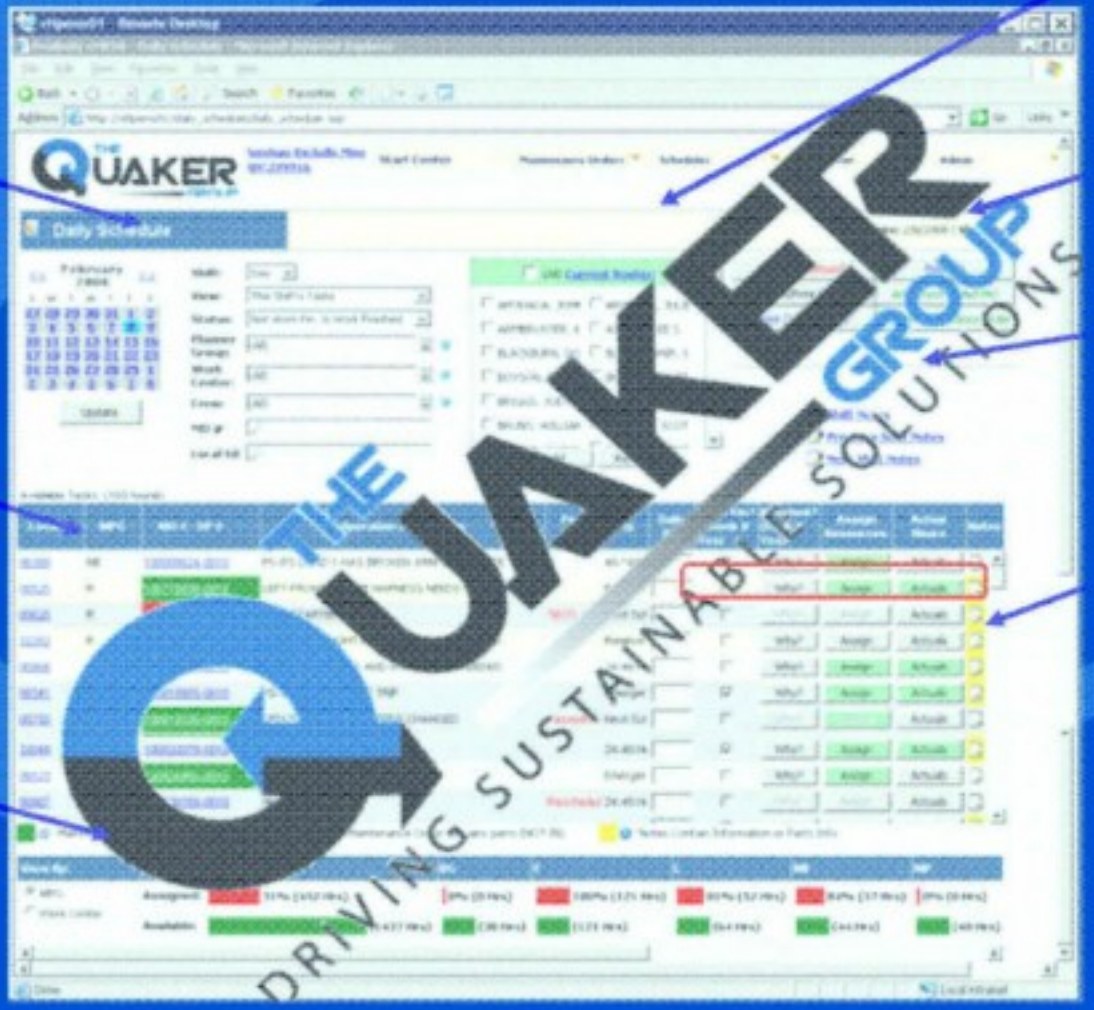
MOP UP Scheduling Functionality

Daily Shift Schedule Example

Filter Criteria

Scheduled Tasks

Resource Assignment Metrics



Current Roster Using MOP UP Scheduling Functionality

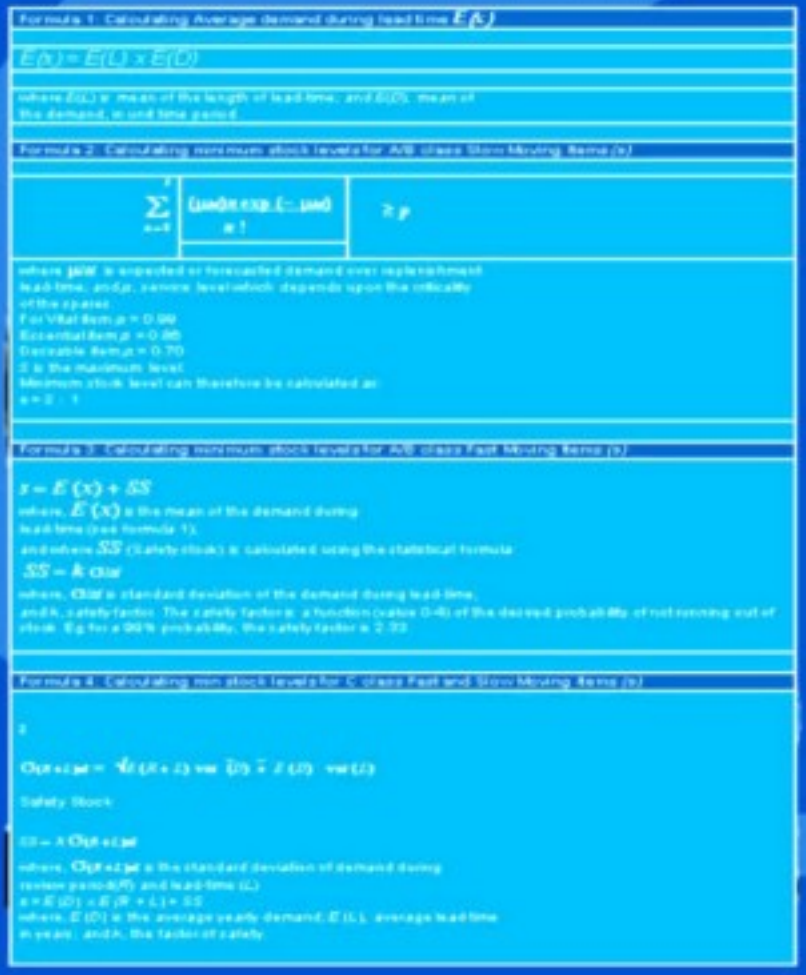
Reports Operations Interface

Shift Notes

Operations Activities:

- Work Finish
- Operation Reschedule
- Assign Resources
- Assign Actual Hours
- Task Notes
- Acutal vs. Planned

Quaker Group Technical Services



The Quaker Group Can Either Educate And Train Staff To Complete These Activities Themselves Or Provide Resources To Assist In The Following Technical Areas:

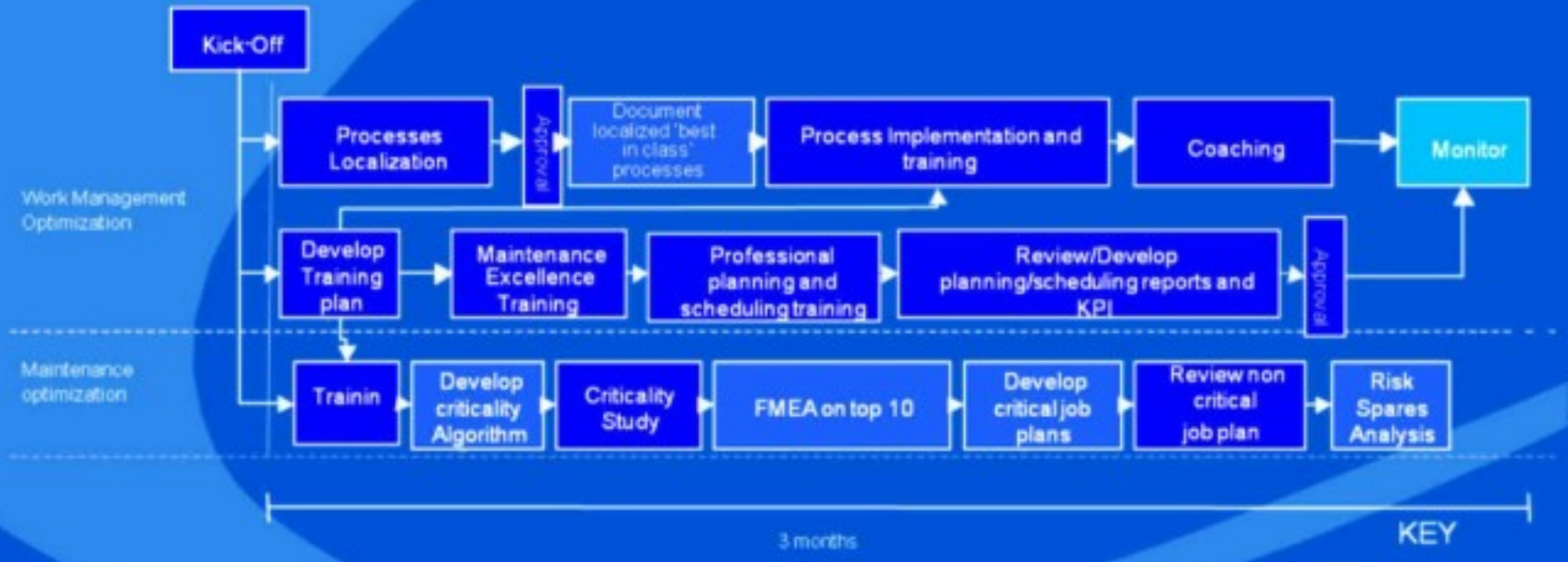
- ARM Analysis – Availability, Reliability, And Maintainability Analysis Completed As Part Of Front End Design Work, Or Ongoing Improvement Programs For Built Assets
- FMECA And RCA – Failure Mode, Effects, And Criticality Analysis, And Root Cause Analysis
- TPM And OEE – Total Productive Maintenance (Continuous Improvement Techniques, 8d, Autonomous Maintenance, Etc.) And The Implementation And Use Of Overall Equipment Effectiveness
- Asset Verification – Where A Client Has A Large And Diverse Asset Base We Assist Them With The Verification Of The Physical Assets And The Subsequent Population Of The Asset Information Within The ERP / CMMS System.
- Condition Monitoring – Working With Technology Partners We Are Able To Provide Fully Outsourced Condition Monitoring Services That Utilize Advance Web-delivery Systems To Ensure Up To The Minute Information Display.

Appendix

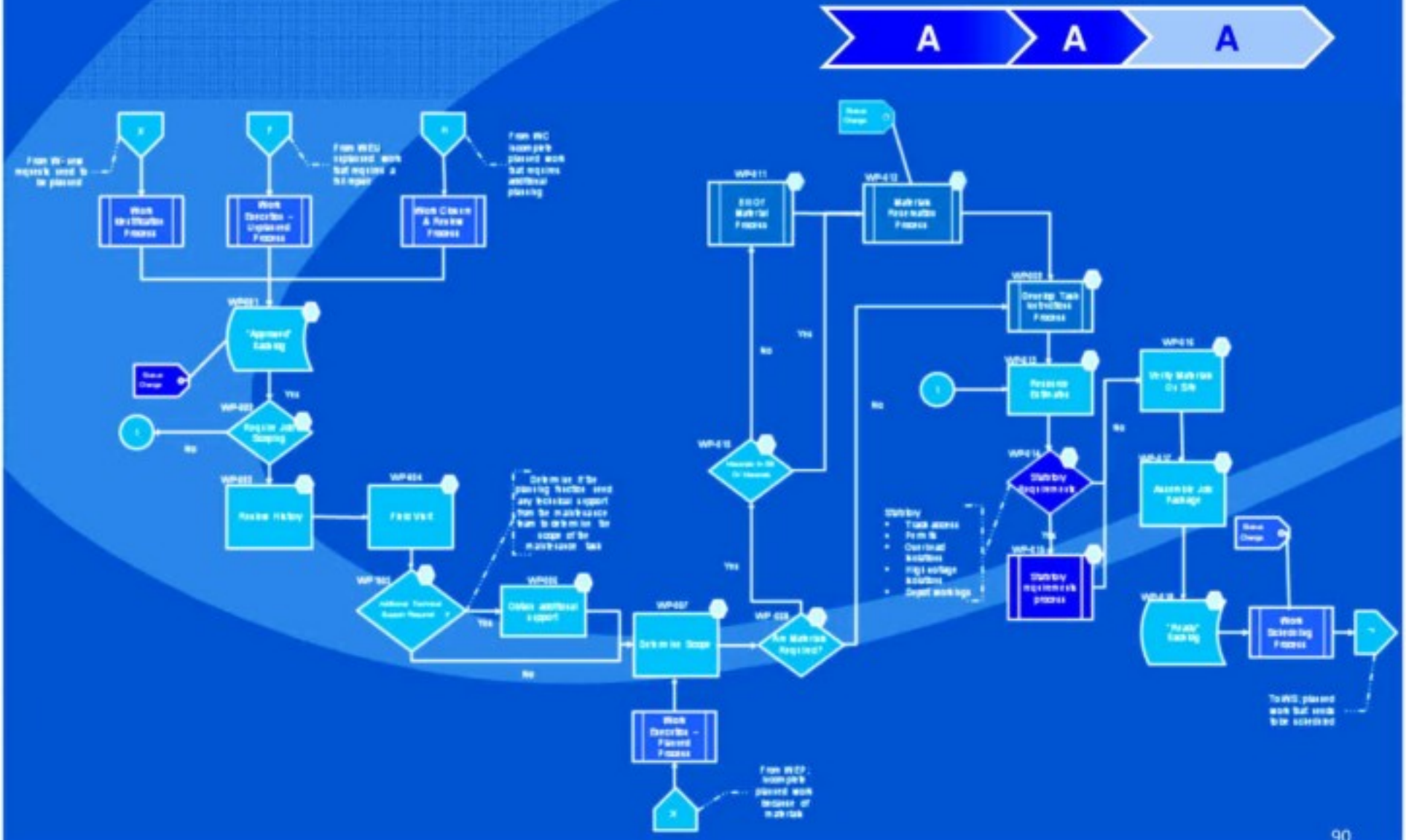
Process Maps

Asset Reliability Process Improvement

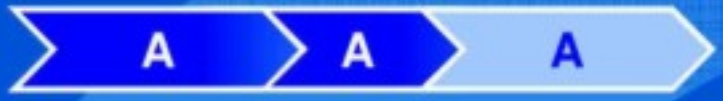
Method Statement

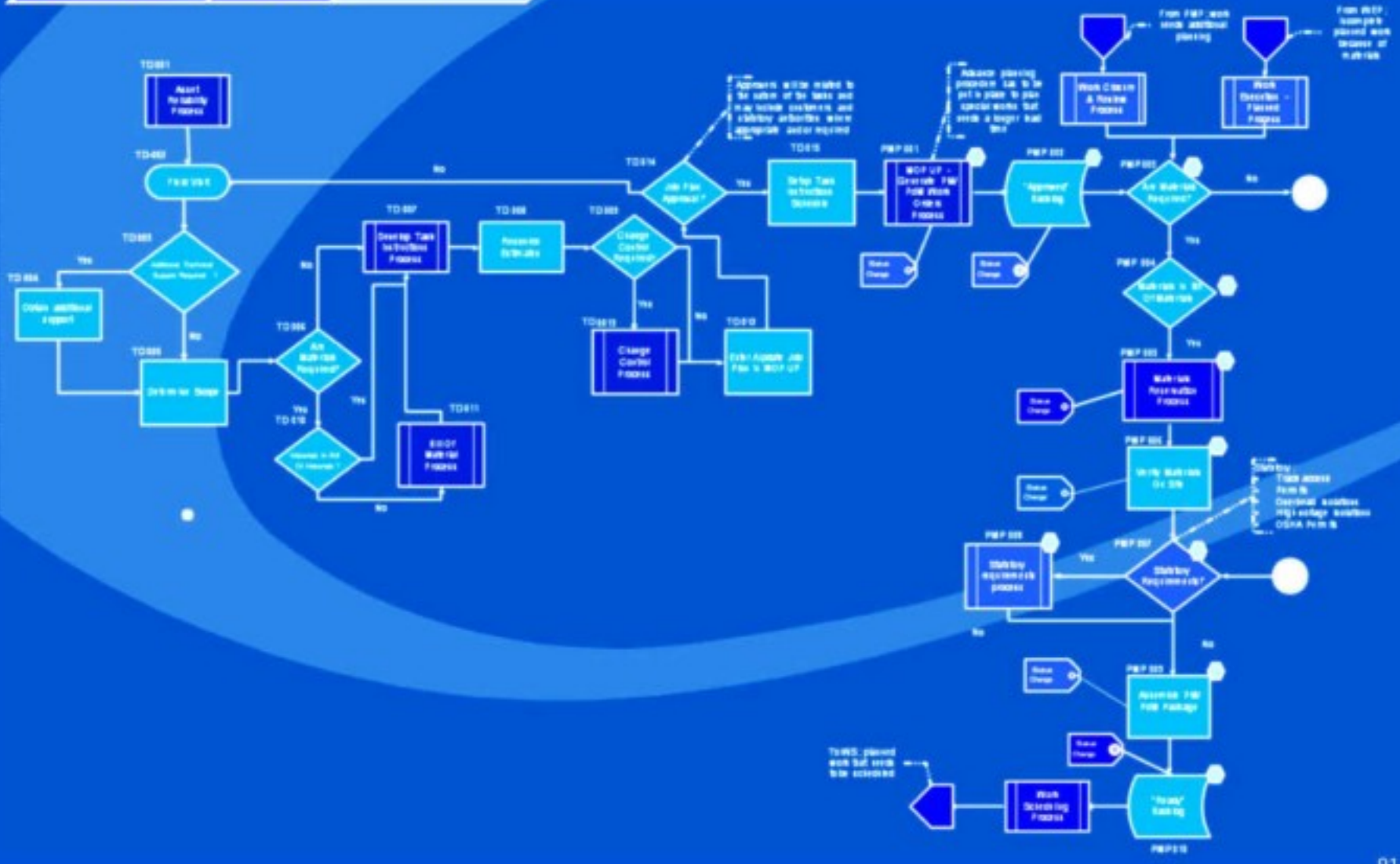


Work Priority & Planning Process

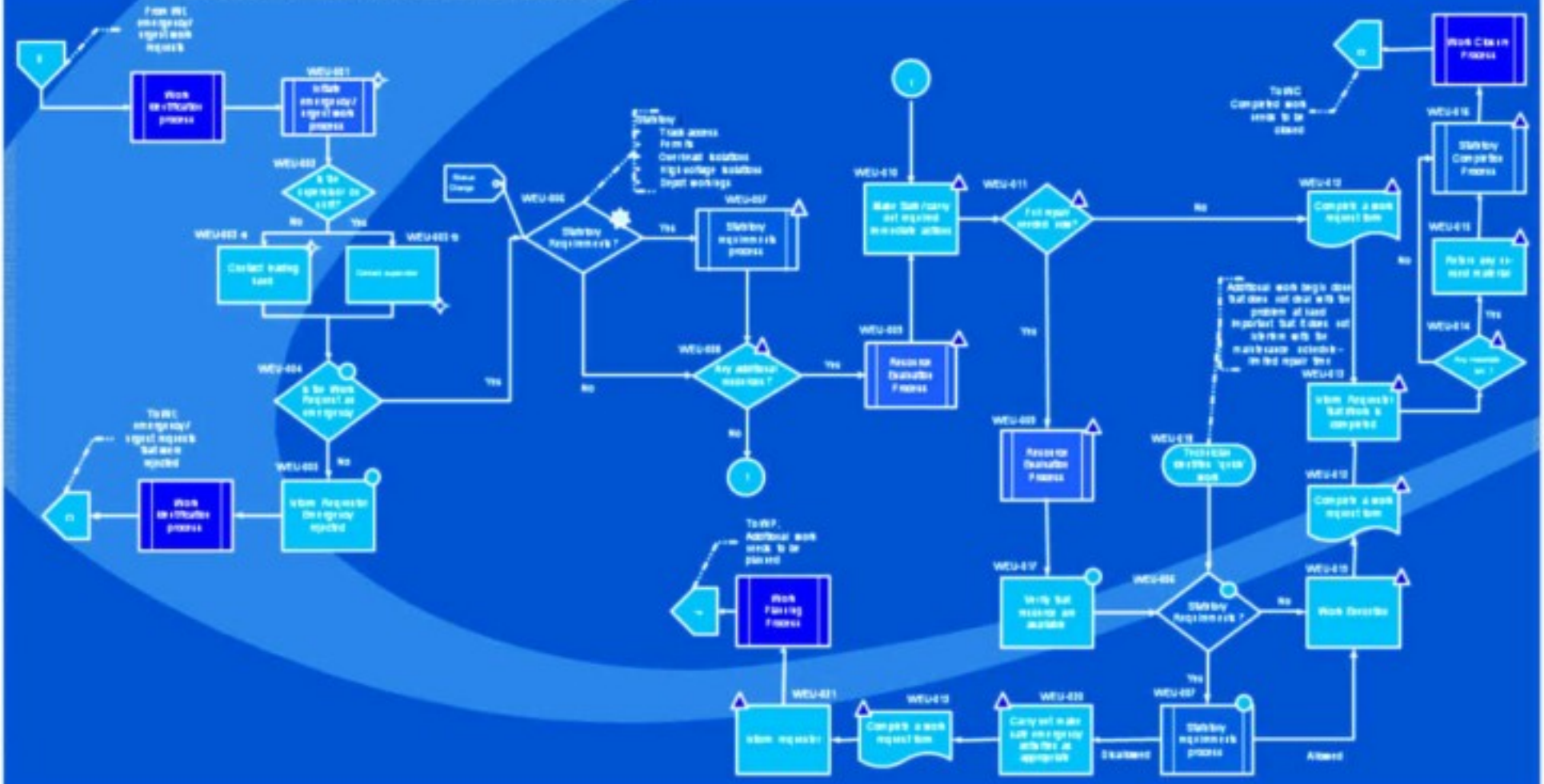


Asset Reliability Process Improvement





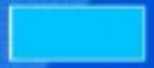
Break-In Work Process



Flowchart Symbols

Process Start/End

Parallelograms Represent **Inputs** And **Outputs** To Or From A Process.



Rectangles Represent Individual Process **Activities.**

Diamonds Represent Important **Decision Points** In The Process

Lines With Arrowheads Connect Symbols To Show The Progression Or Direction Of The Activities.

Circles Represent Connectors When A Process/Procedure Flowchart Continues On The Next Page.

Document - A Printed Document Or Report.