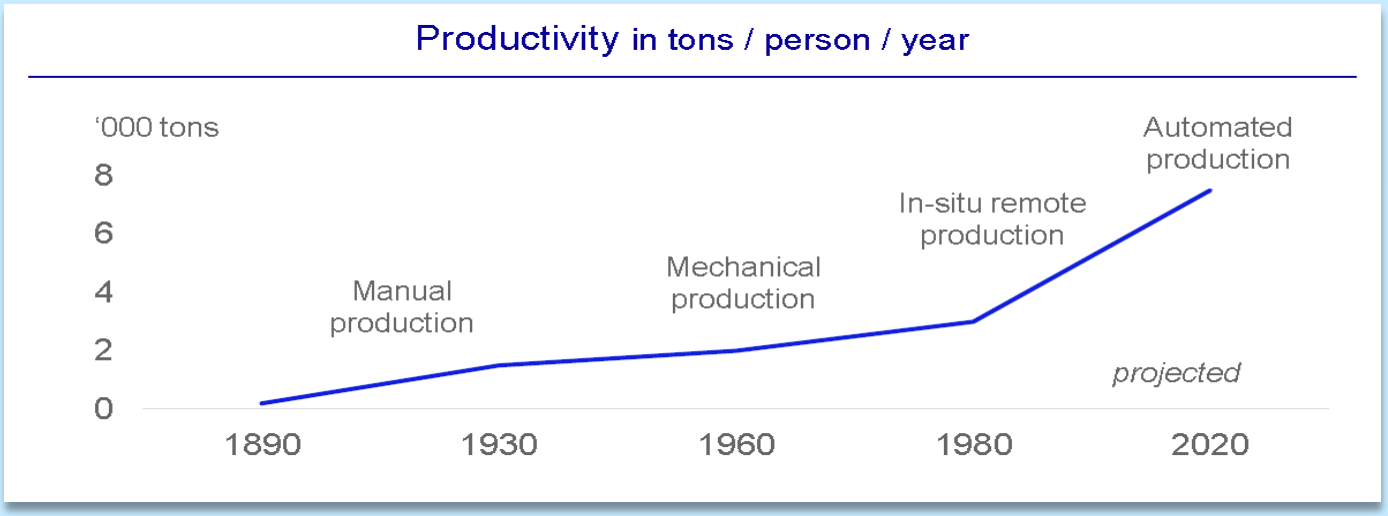
Eduardo Gallestey, Business Unit Process Industries - June 9, 2015

Next level mining
Enabling technologies and applications – Part 1

The mining industry today
The main challenge is productivity improvement



Four key mining industry requirements

- **Productivity**
- **Safety**
- **Environment sustainability**
- **Reliability**

Mechanization

- Standardization of processes
- Mechanization means dramatic shifts in production capabilities
- Operation of equipment still requires human interaction

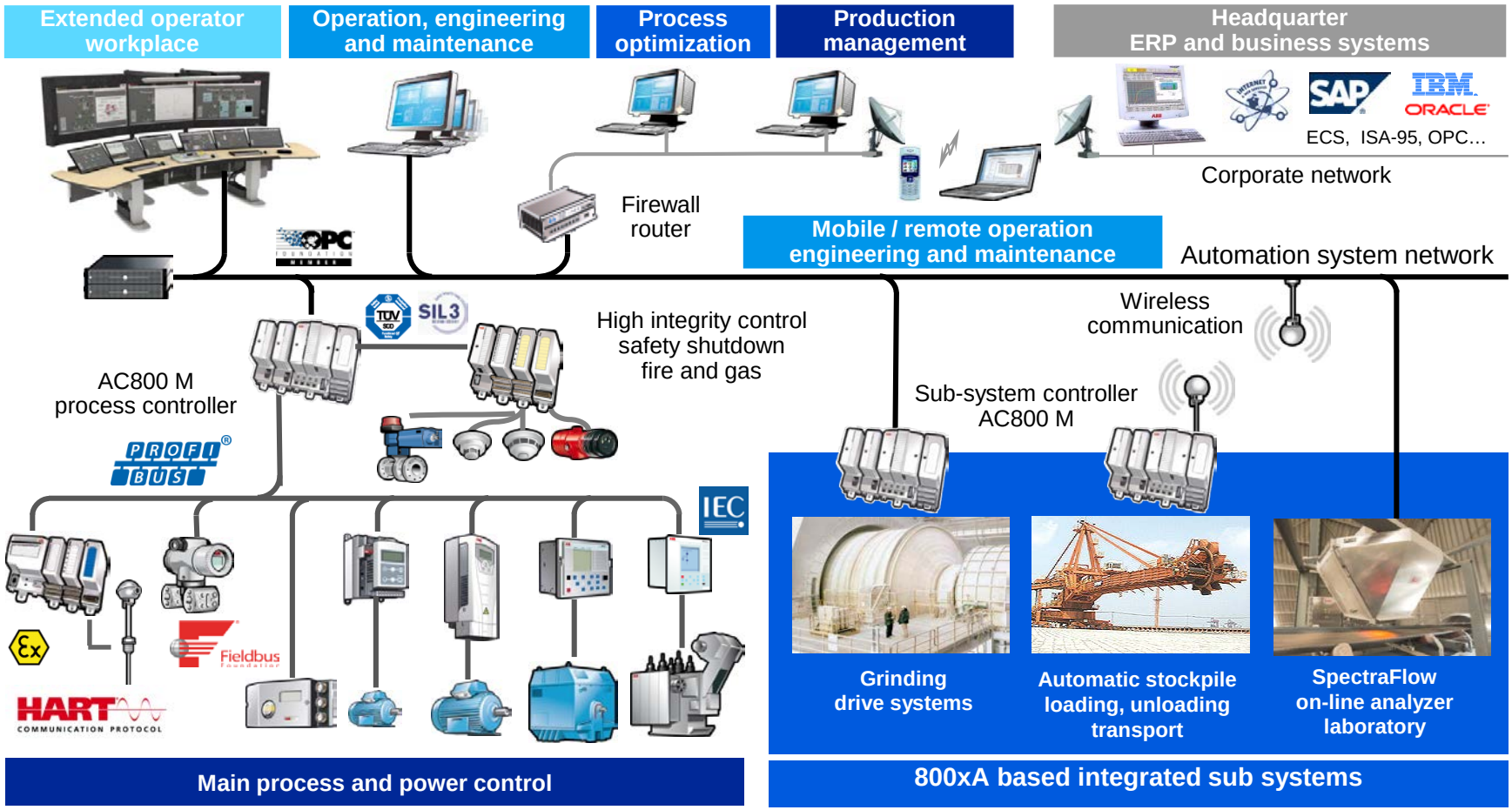
Automation

- Integrated modeling and planning for higher quality yield
- Greater visibility into parts of the value chain
- More detailed information coming from equipment and plant to enable remote mining

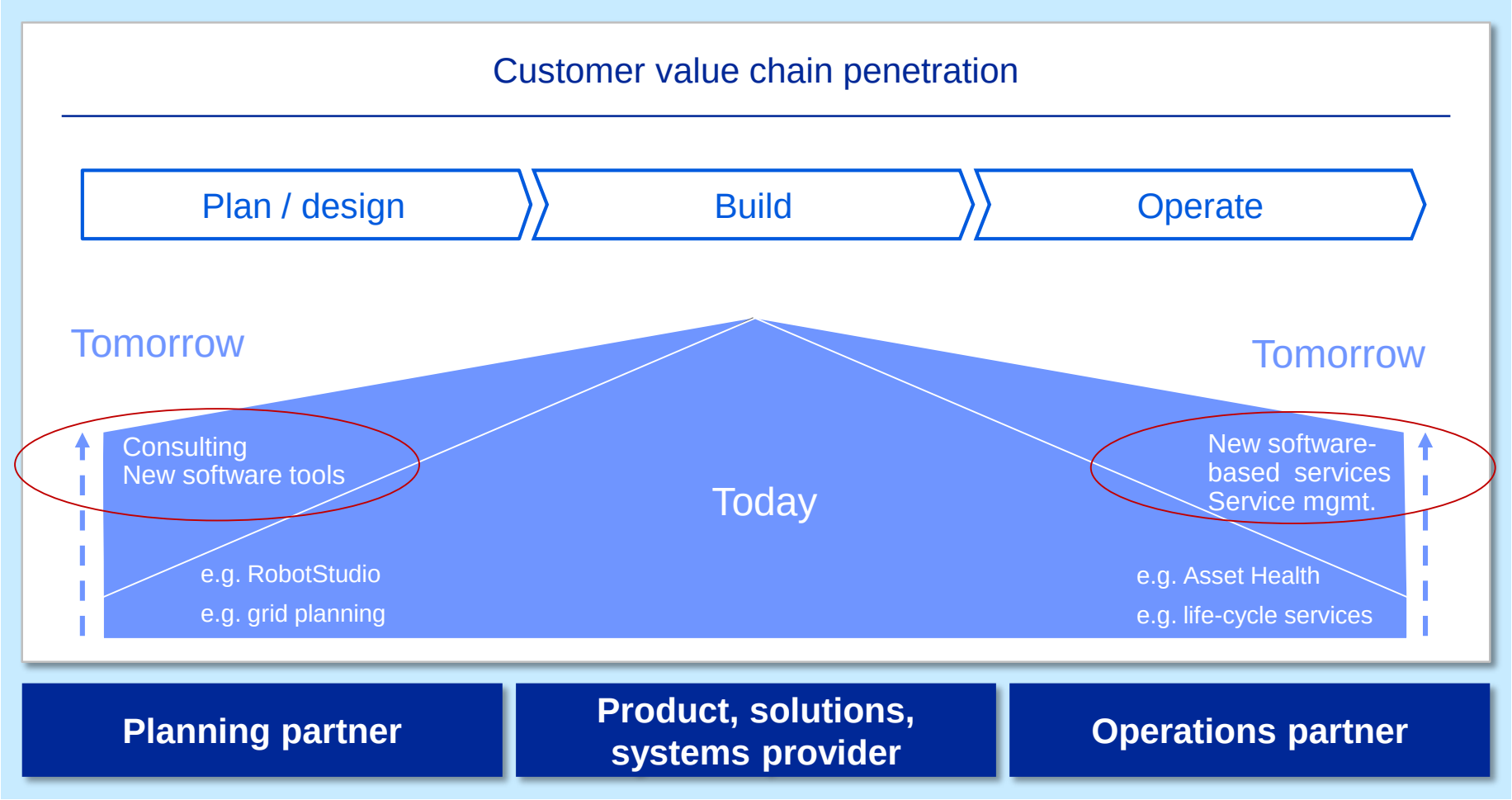
Optimization

- More responsive demand and supply
- Higher level of automation driven by labor shortages and remote mining locations
- Limiting bottlenecks by adopting more continuous processes
- High levels of visibility across the value chain and between operations

ABB in Mining today
Fostering a one-system approach

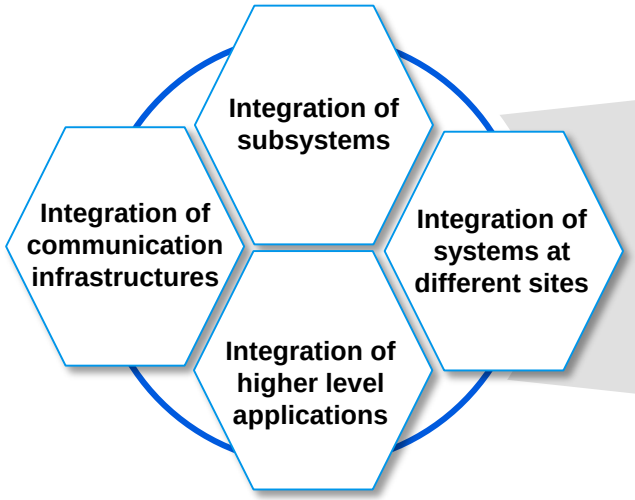


Next level mining
Expanding customer value proposition beyond the simple system provider approach



Next Level mining
Through power and automation integration

Integration of equipment, systems and people…



…enabled by technology…

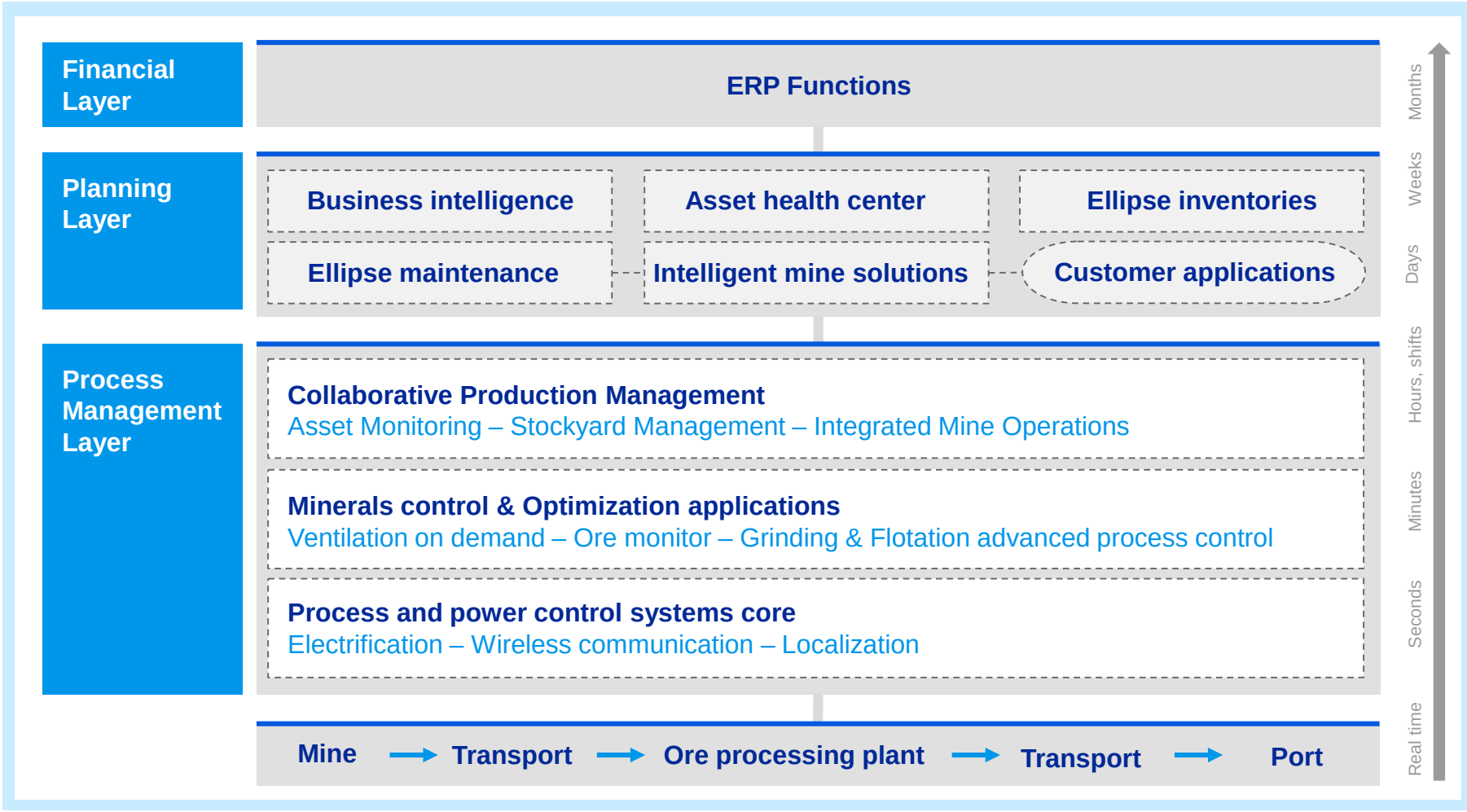
Aspect Objects™

- Object centric information access
- One Click to all information
- Direct navigation from any aspect to the next
- Information filtering based on job role/function
- Real-time decisions and action

…to get one common view

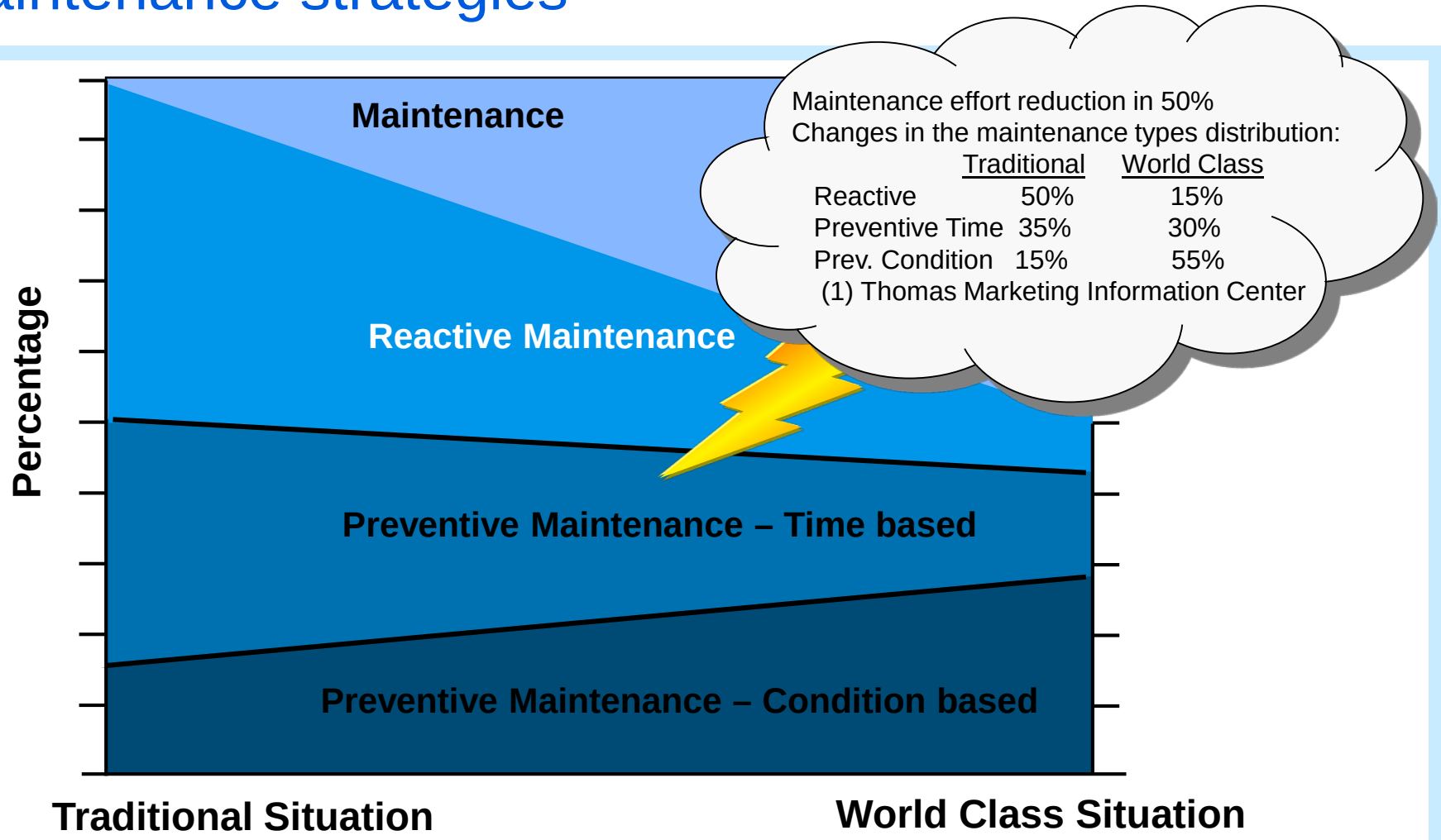
- **An infrastructure that can represent all the assets**
- **Embed all applications and systems**
- **Share information without barriers**
- **Bring teams together and get the best from all teams**
- **Empower people to perform their best**

ABB in Mining solution suite
A holistic approach to the entire mine operation

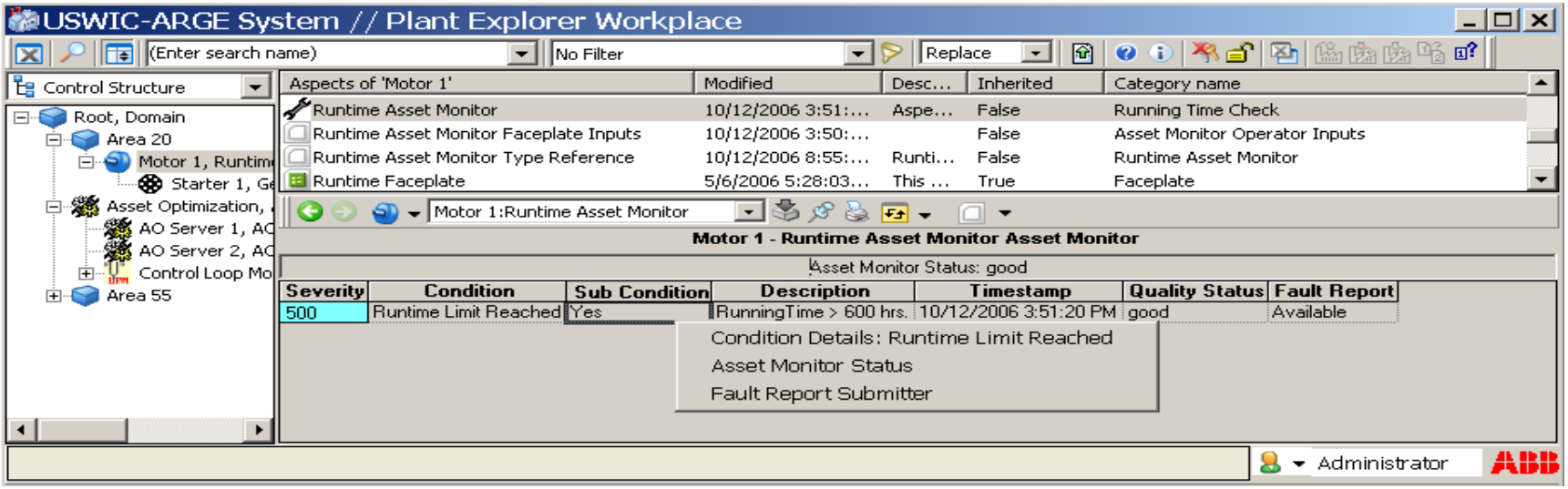


Collaborative Production Management

Collaborative Production Management
Asset optimization, unleashing value towards new maintenance strategies



Collaborative Production Management
Asset Monitors, providing awareness on asset condition in real time

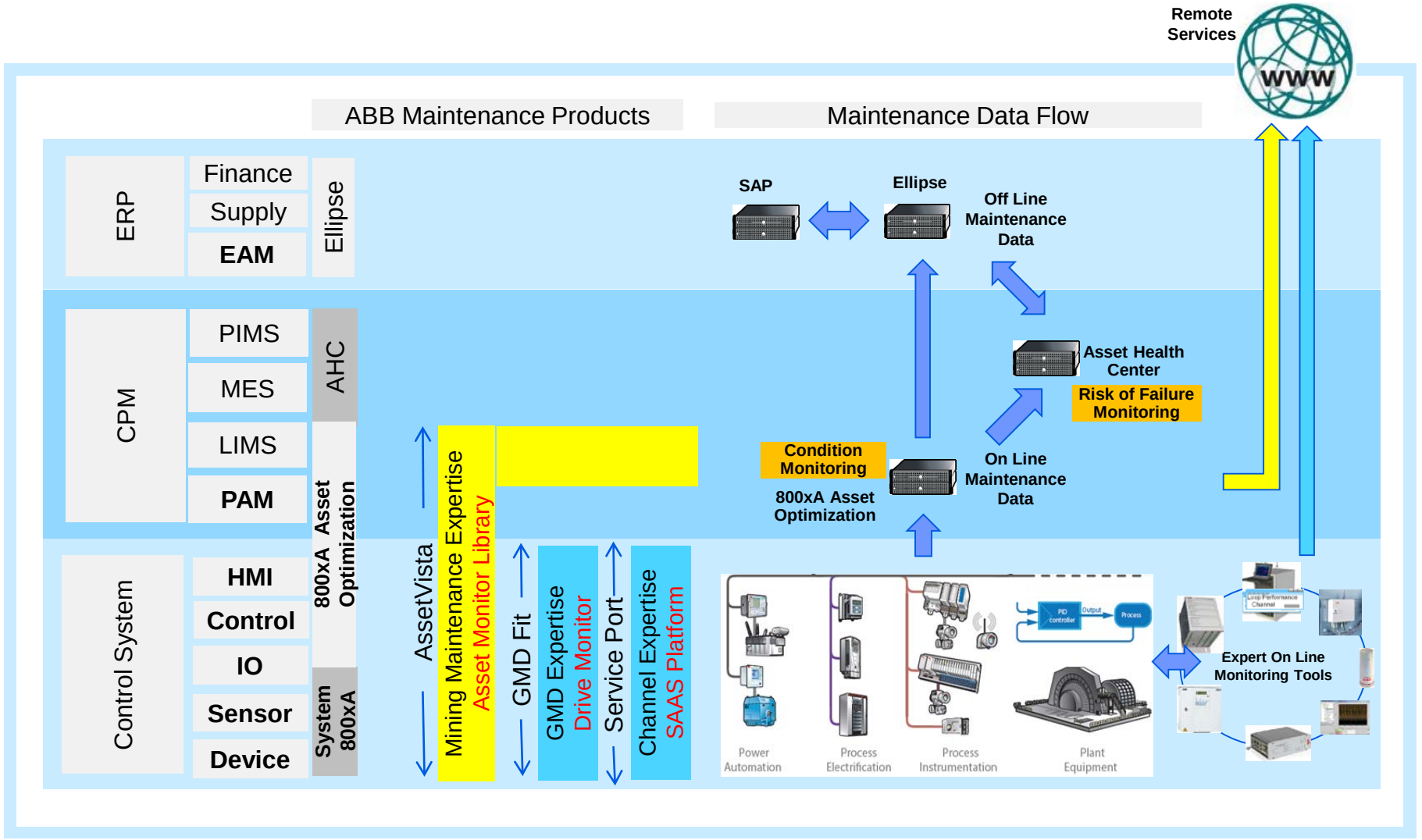


- Asset Monitor is a software component that monitors and promptly reports one or more conditions of an asset
- Asset Monitors can receive data from multiple OPC data sources including 3rd party
- Asset Optimization (AO) is fully integrated into System 800xA

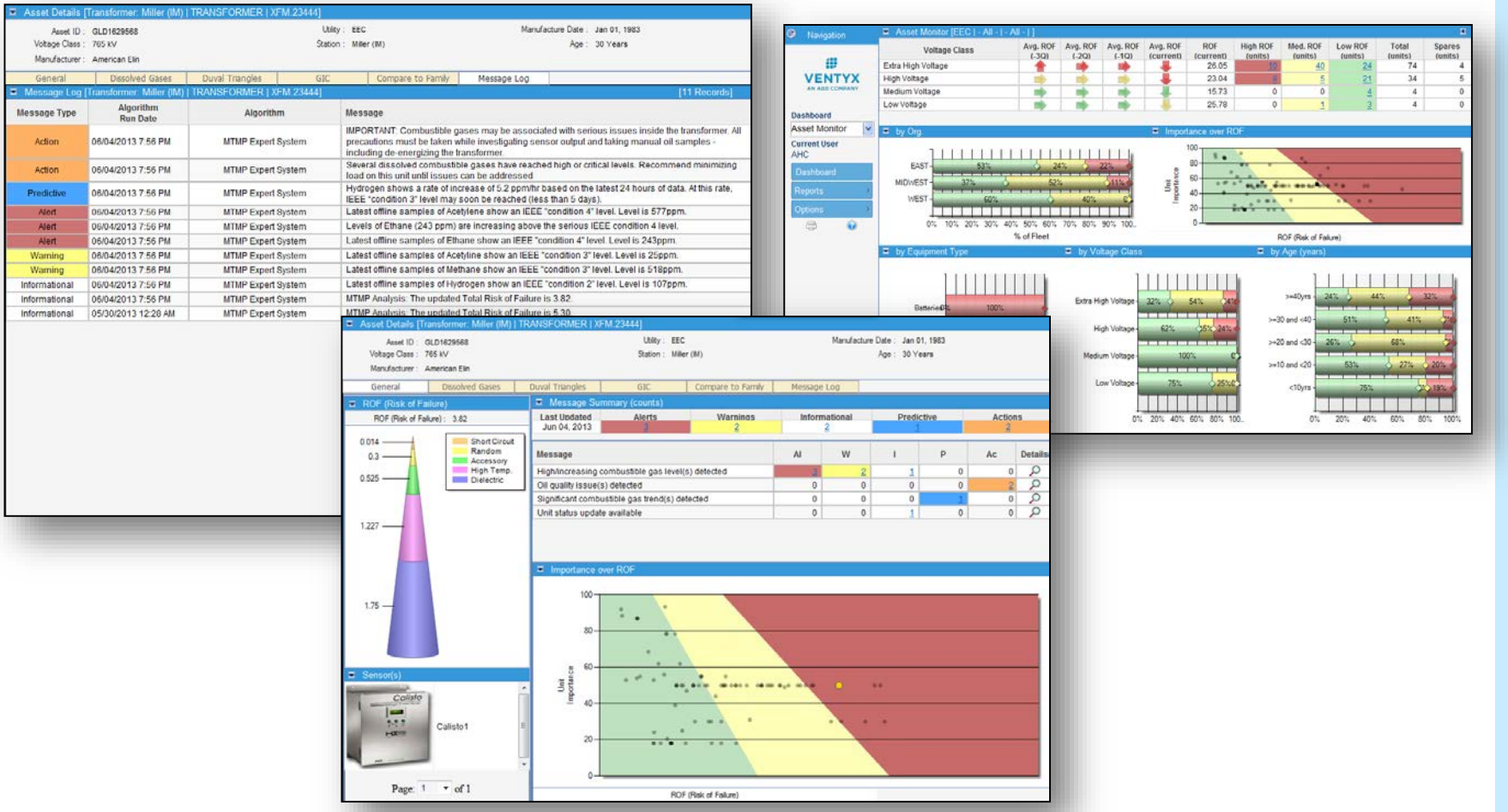
Collaborative Production Management

AssetVista dashboard, providing awareness on asset condition in real time

Collaborative Product Management
Asset monitors generate value at enterprise level



Collaborative Product Management
Asset Health Center: enterprise wide solution

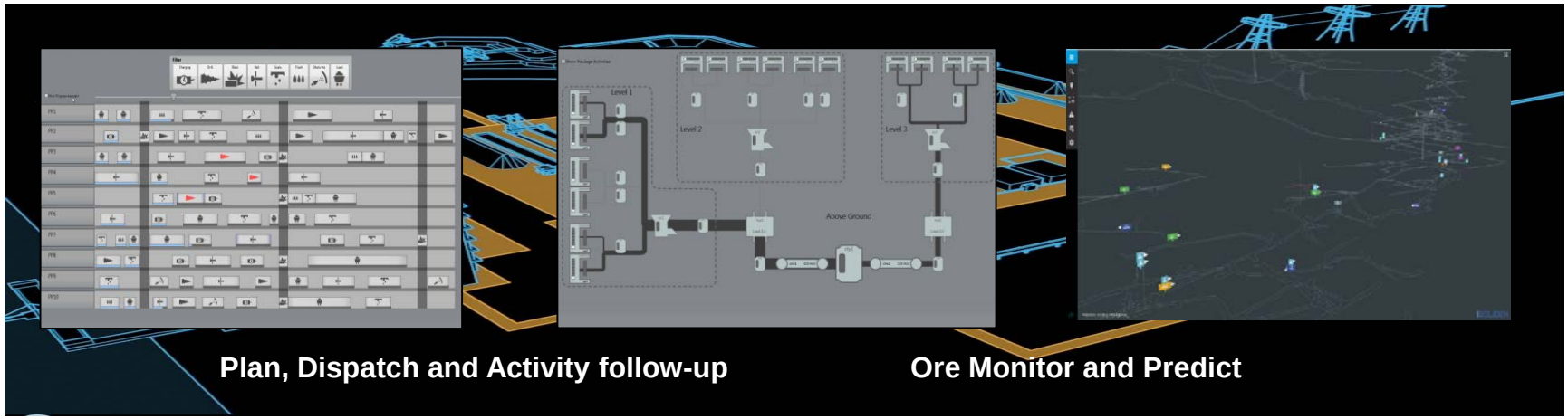


Minerals control & optimization applications

Minerals control and optimization applications
Ultimate link between control and enterprise levels

Mine Design | Production Planning | Assets | Work Force | Customers | Investors | Finance

Production plan | *Asset availability* | *KPI report&visualization* | *Status on-line*



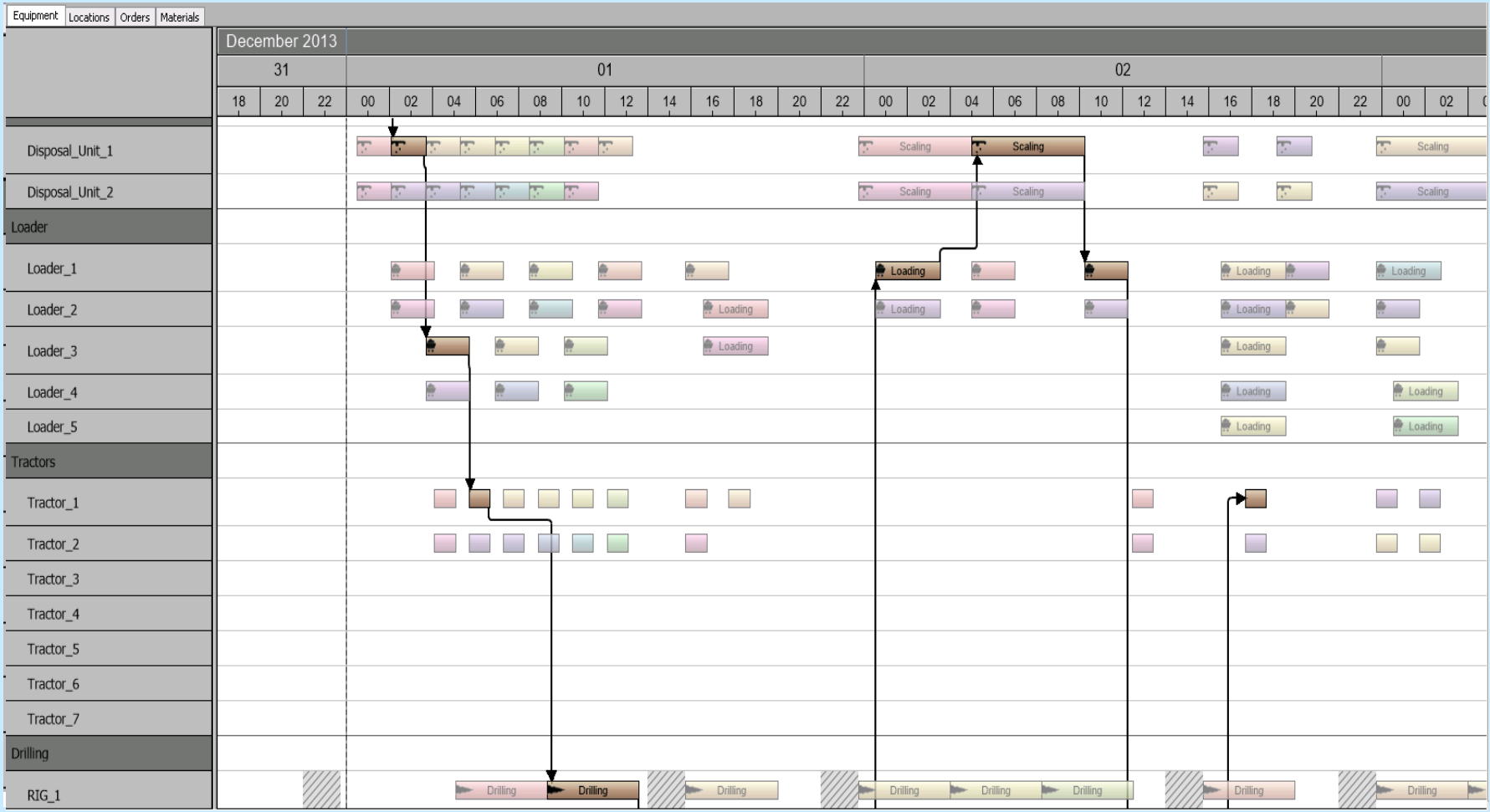
Work orders | *Activity report* | *Machine operation data* | *Production data Machine position*

Control system	Control system	Control system	Control system	Control system	Control system	Control system	Control system
Drilling Rig	LHD/Trucks	Hoits	Mills	Flotation	Material Handling	Stockyard	Port

Minerals control and optimization applications
Production scheduling and dispatch

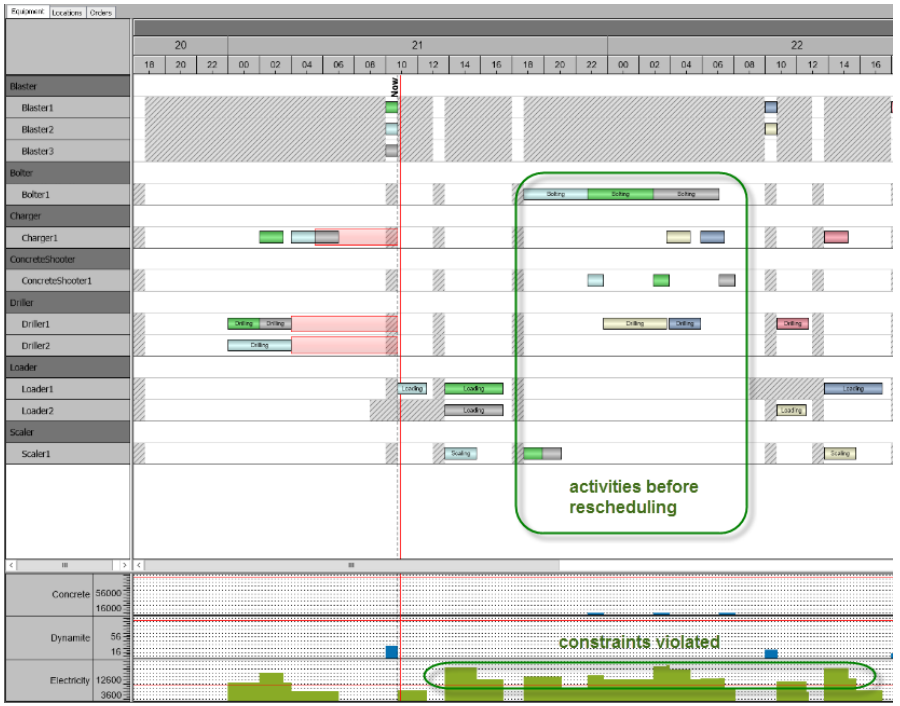
- Software package where mine operators dispatch and track operations in real time, increasing operational transparency and enabling decisions for best operations in real time.
- Functionalities
  - Visibility of all resources across the mine
  - Plan continuously updated, based on truly existent resources.
  - Optimal response to disturbances in real time
  - ISA 95 based data store holds mine's past present and planned activities
  - Scheduling engine supporting optimal decision making, including constraint checking mechanisms to enforce resource availability

Minerals control and optimization applications
A cockpit to provide full visibility & enable optimization



Minerals control and optimization applications
Integrated energy and water management

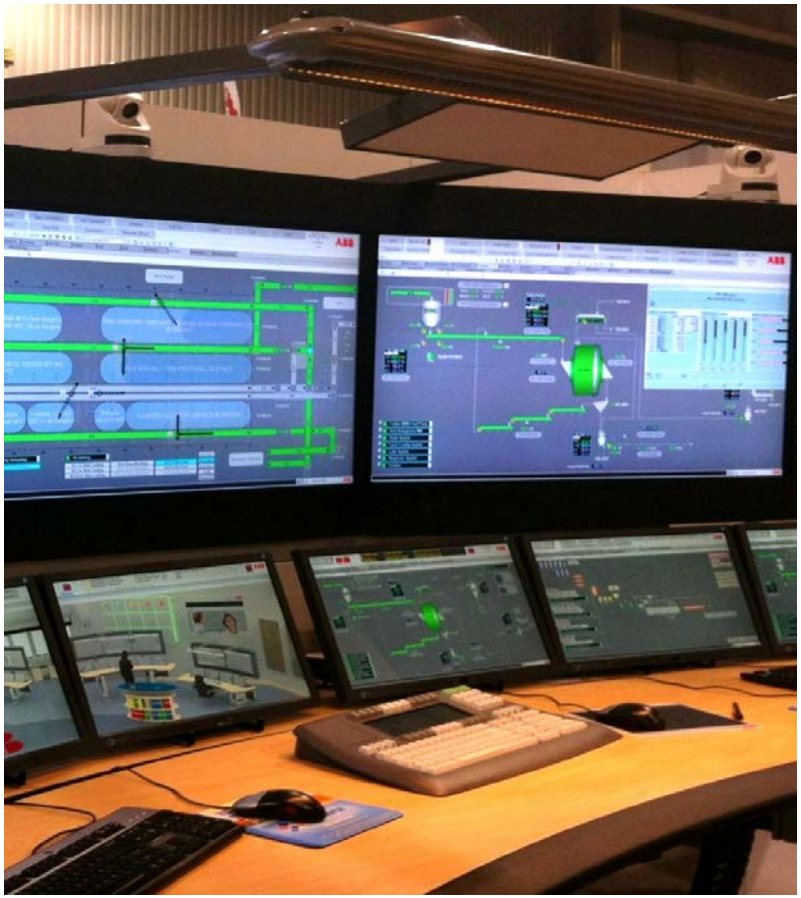
- Predict accurate energy demand schedules to lower purchase costs and avoid penalties
- Manage complexity from varying energy price and power availability by allocating energy consumption to off-peak hours and energy production to peak hours
- Same framework can be used to manage of other limiting factors such as water and fuels



Select resources to enable production schedule at minimum cost

Securing the future of mining
ABB's vision for mining companies is now closer

- ABB portfolio provides visibility and optimization across the value chain
- ABB products and systems will drive fundamental change in the way a mining enterprise works, creating dramatic increases in
  - Process productivity
  - Predictability of operations
  - Asset reliability
  - Energy efficiency
  - Health, safety
  - Protection of the environment



Power and productivity
for a better world™