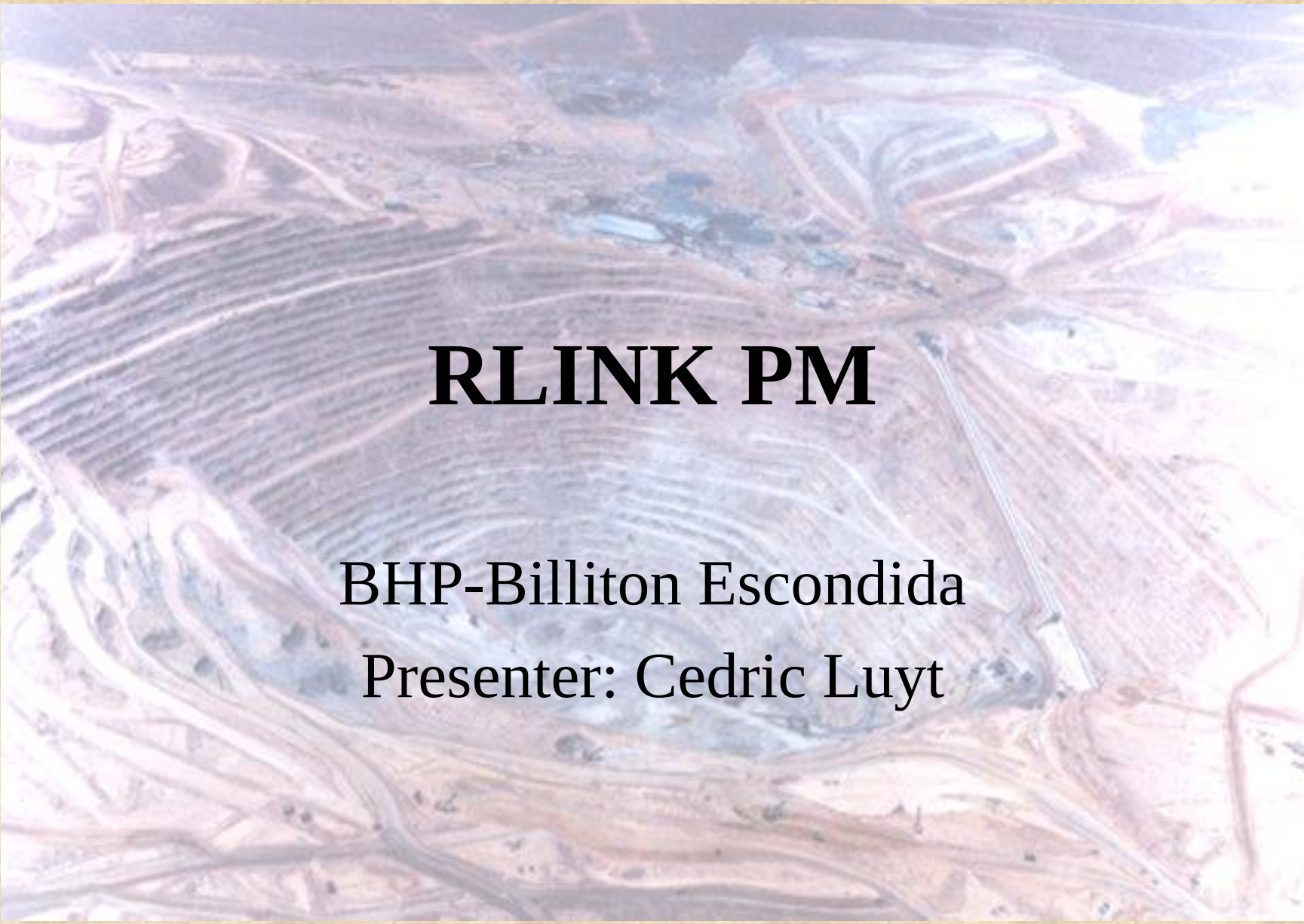




RLINK PM

BHP-Billiton Escondida

Presenter: Cedric Luyt

Overview

- Process Overview
- Maintenance Requirements & Design
- Systems Overview
- Systems Integration
- RLINK Implementation
- Project Tips



Process Overview

- Ownership: BHP (57.5%), Rio Tinto (30%), a Japanese consortium (10%) and the International Finance Corporation (2.5%).
- Minerals: Copper, Gold, Silver
- Mine, Concentrator, Oxide, Pipeline, Coloso Port

Process Overview

- Open Pit Copper Mine 3050m Altitude
- Concentrator Cu 776KT pa, 120 000 T/day
- Oxide Plant 140 000 T copper pa.
- Concentrate pumped to port for shipping
- Copper Plate shipped to port

Pit



Leaching



Concentrator



Port Coloso



Process Overview

Truck Fleet



Concentrator



Loader



Coloso



Maintenance Requirements

- Objective
 - Reduce unnecessary planned maintenance
 - Reduce maintenance downtime
- How?
 - Usage based Maintenance rather than Time Based
 - Automatic maintenance notification generation based on Equipment Status

Maintenance Requirements

- Benefits of Integrated Usage Based Maintenance
 - Reduce effort of manual logging.
 - Improve accuracy of information for maintenance planning
 - Reduce maintenance costs
 - Improve reliability
 - Improve production

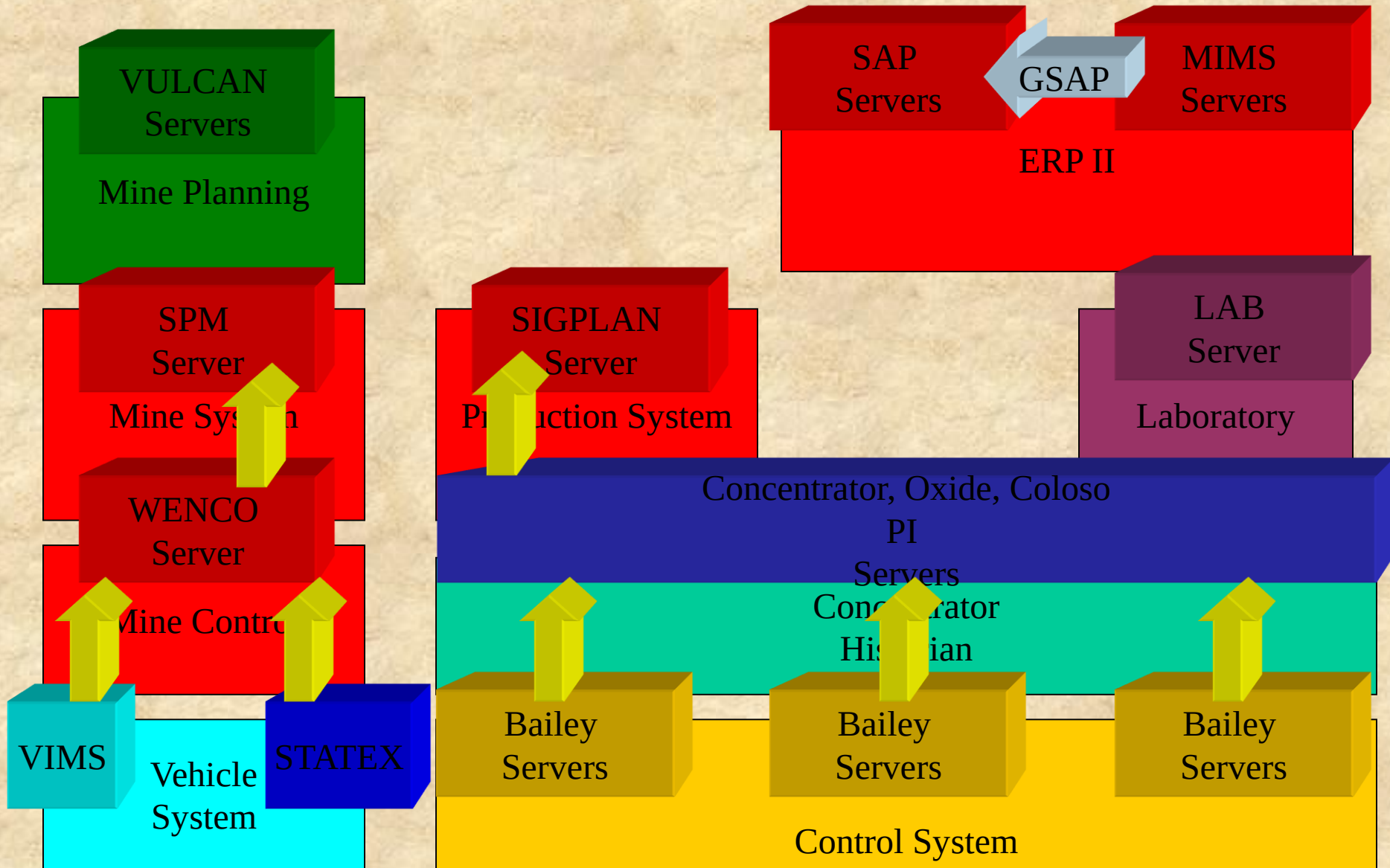
Maintenance Requirements

- Benefits of Automatic maintenance notification generation
 - Reduce turn around time
 - Improve equipment availability
 - Improve production throughput
 - Relate maintenance downtime event information with maintenance notification and work order process cycle

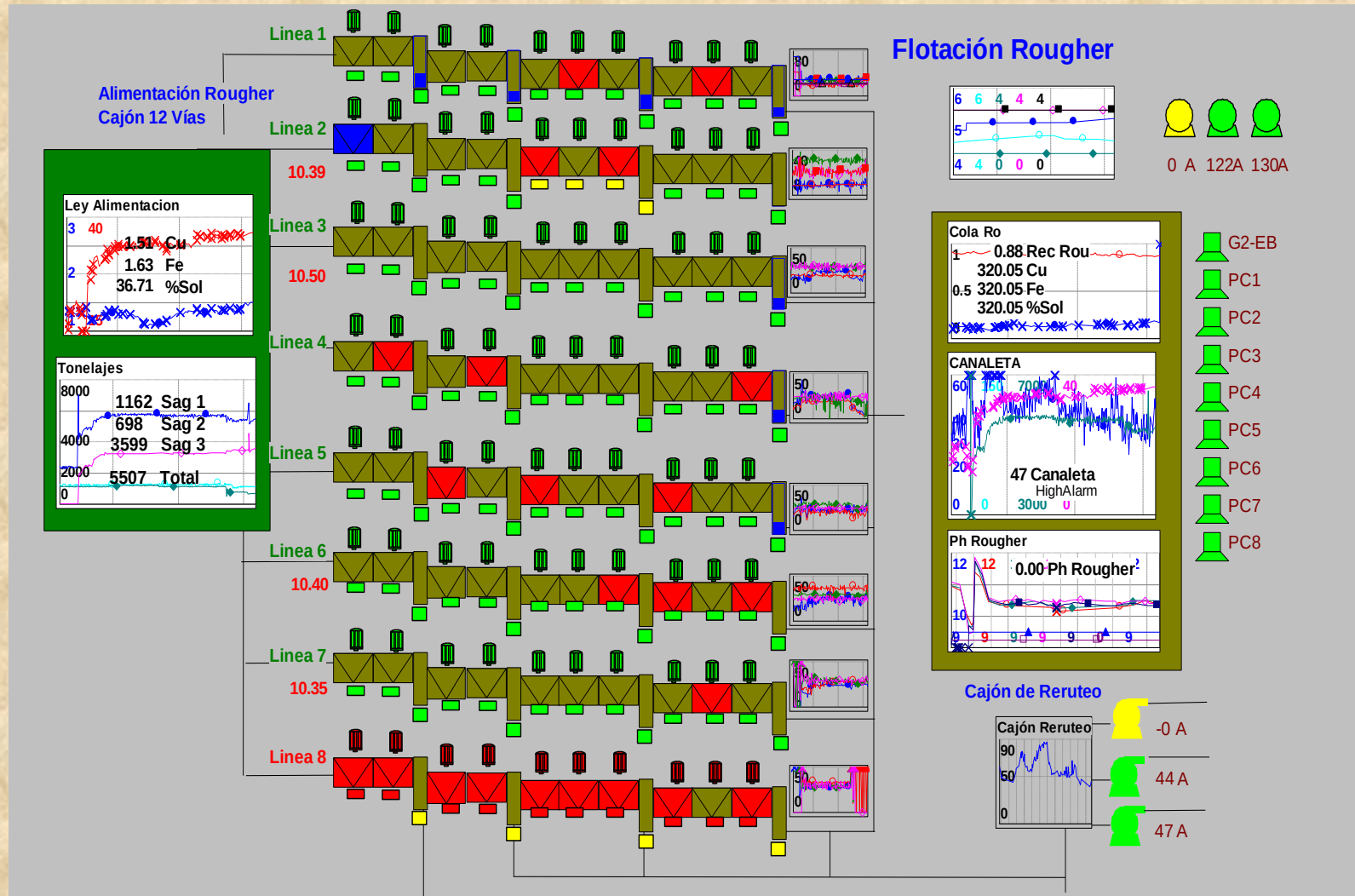
Design

- Methodology
 - Find an appropriate the source of Equipment Usage and Status in the Mine and Plant
 - Transfer information to the Plant Maintenance System
 - Incorporate the Usage Parameters into the Plant Maintenance planning process
 - Use the Status Parameters to proactively drive the Maintenance Notification process
 - Continuously improve and tune the system as experience is gained

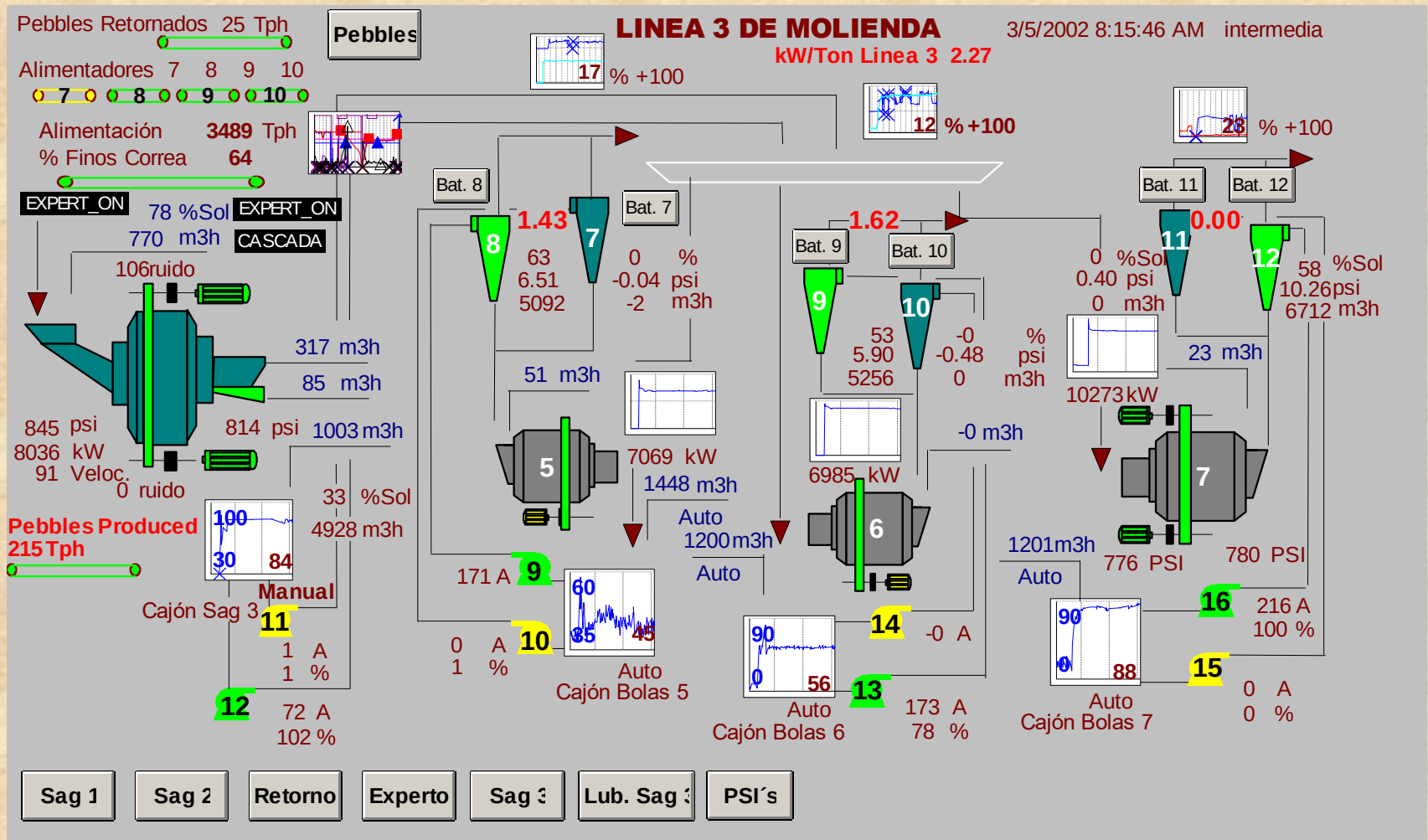
Systems Overview



PI PB Concentrator



PI PB Grinding Line



PI PB Energy

Resumen Planta Molienda

Total Planta	día	noche
Estimado	64888	61039
Real	3772	61039
Puntual	5440	

Pebbles Chancado 25 Tph



EXPERT_ON

Correa 1 1150 Tph

% Finos 77

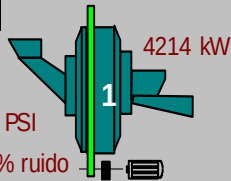


día noche

Estimado 13823 15093

Real 857 15093

Sag 1



22 % +100

4125 kW

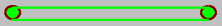
0 % +100

4358 kW

EXPERT_ON

Correa 2 698 Tph

% Finos 57

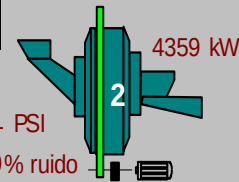


día noche

Estimado 8527 13701

Real 543 13701

Sag 2



0 % +100

55 kW

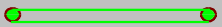
27 % +100

4001 kW

EXPERT_ON

Correa 3 3566 Tph

% Finos 62

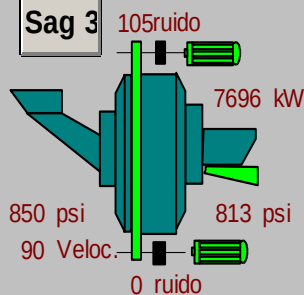


día noche

Estimado 42901 32245

Real 2619 32245

Sag 3



0 % +100

7070 kW

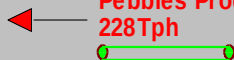
14 % +100

7058 kW

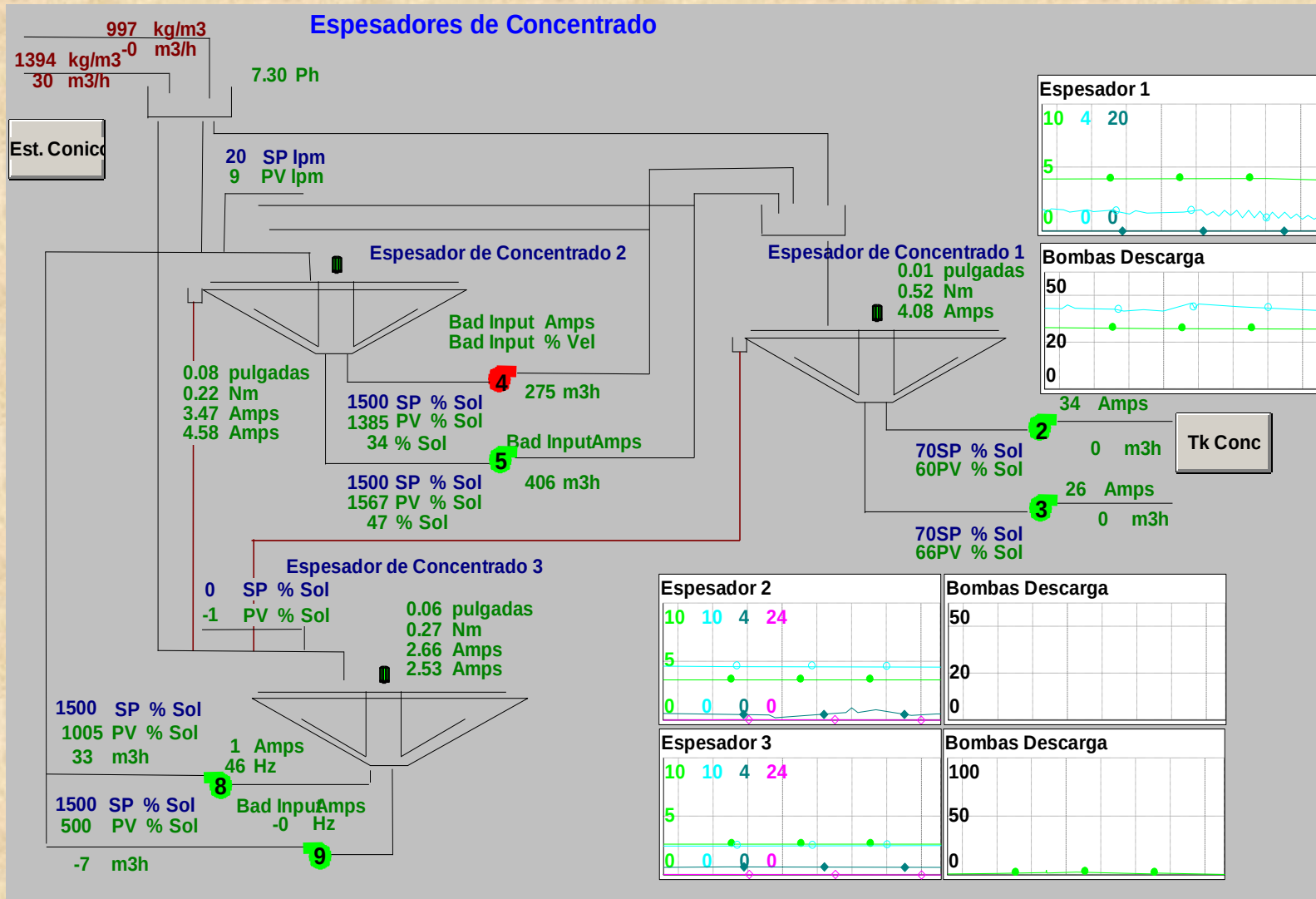
20 % +100

10234 kW

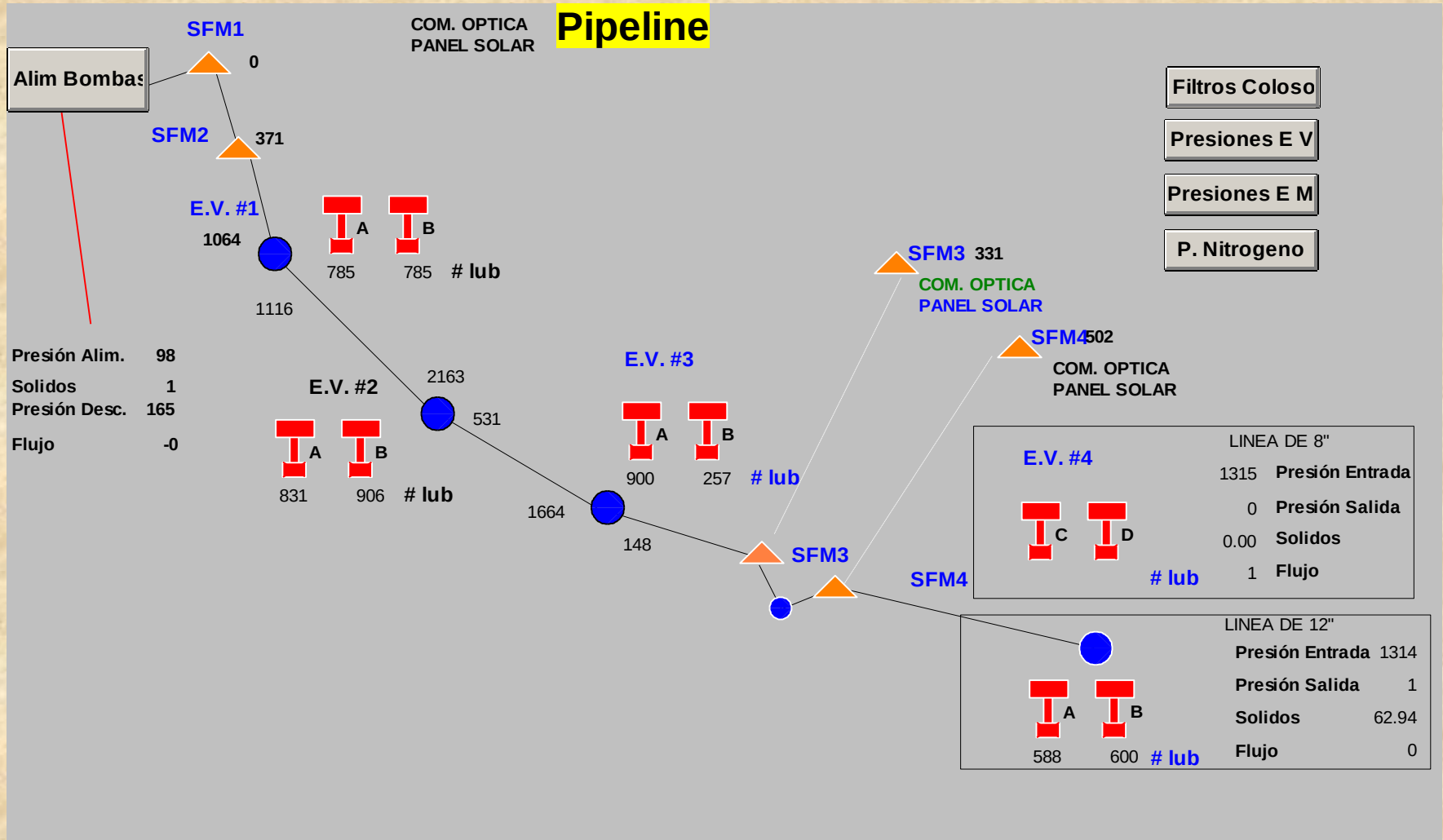
Pebbles Produced 228Tph



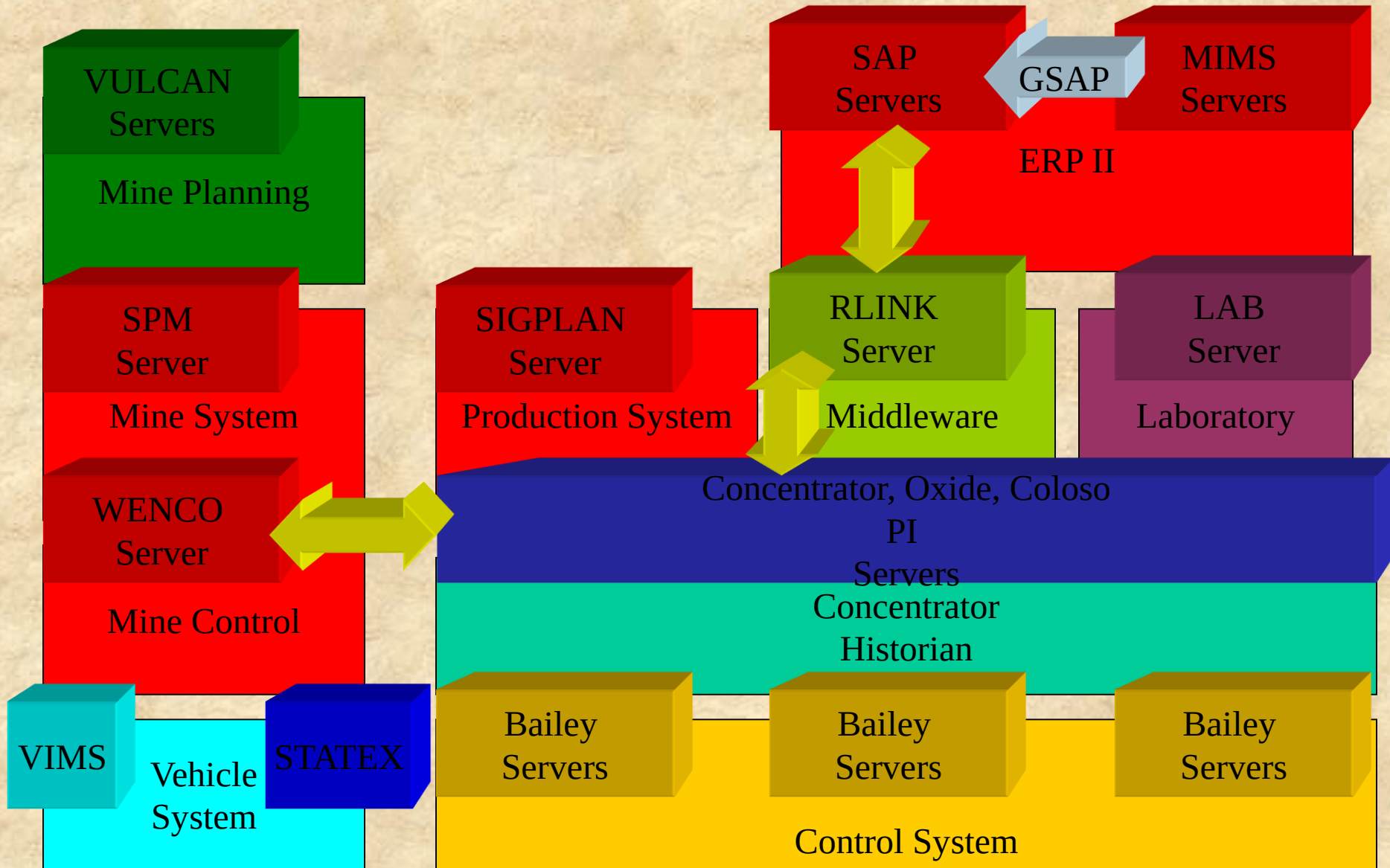
PI PB Concentrator



PI Process Books



Systems Integration



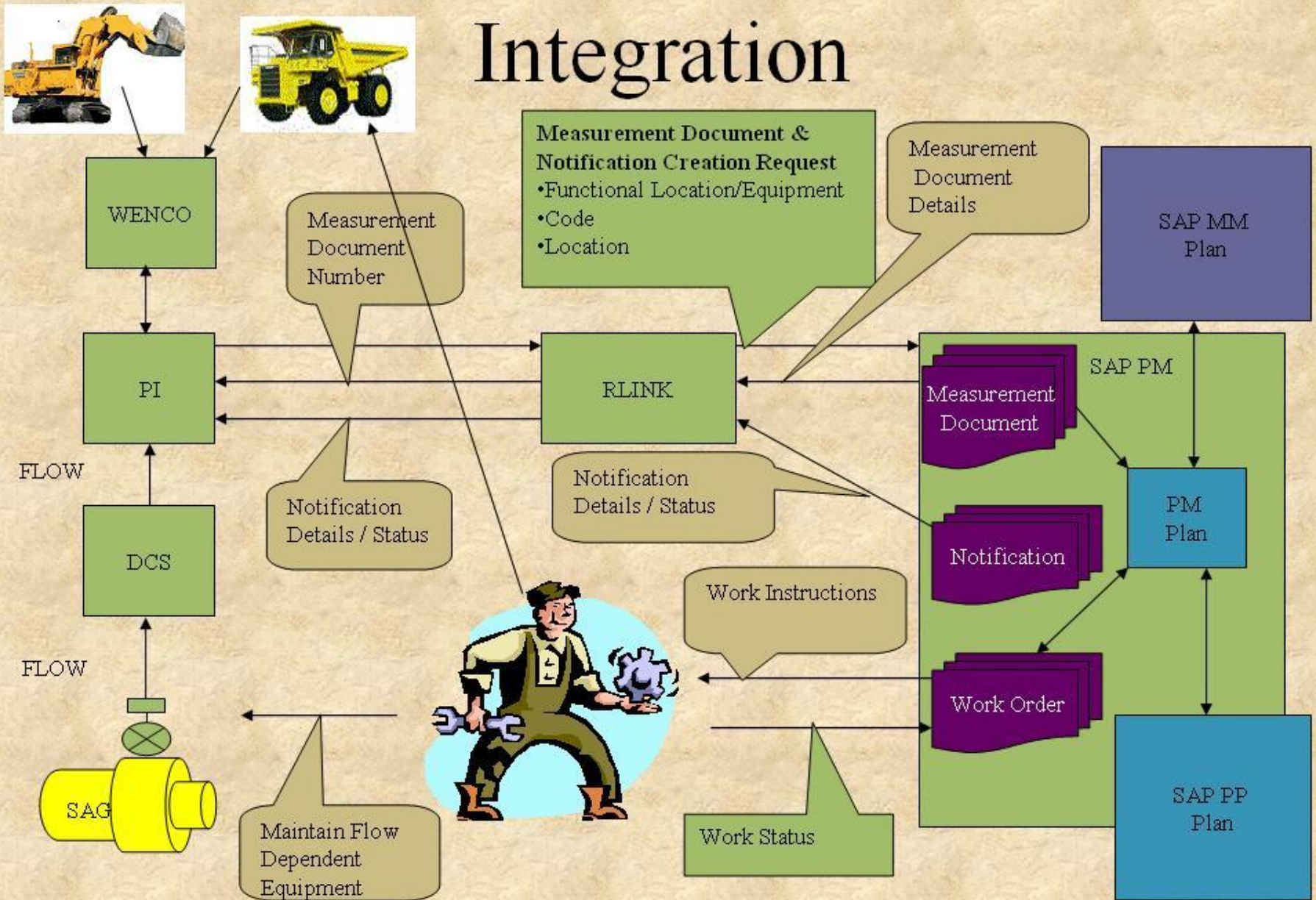
Systems Integration

- Integration of Wenco and OSI PI – W2P
 - Extract the Equipment Status & Location
 - Determine Equipment Usage
 - Transfer information from Oracle to PI
 - Wenco to Receive Notification Number
- Integration of DCS and OSI PI
 - Equipment Status transfer information from DCS to PI
 - PI determines Equipment Usage
 - PI to Receive Measurement Document and Notification Number

Systems Integration

- OSI PI to SAP PM Notification
 - Equipment breakdown statuses trigger alarm
 - RLINK PM monitors alarm and creates notification for SAP PM Functional Location for Equipment
 - Returns Notification number to PI and Wenco
 - Maintenance responds to notification

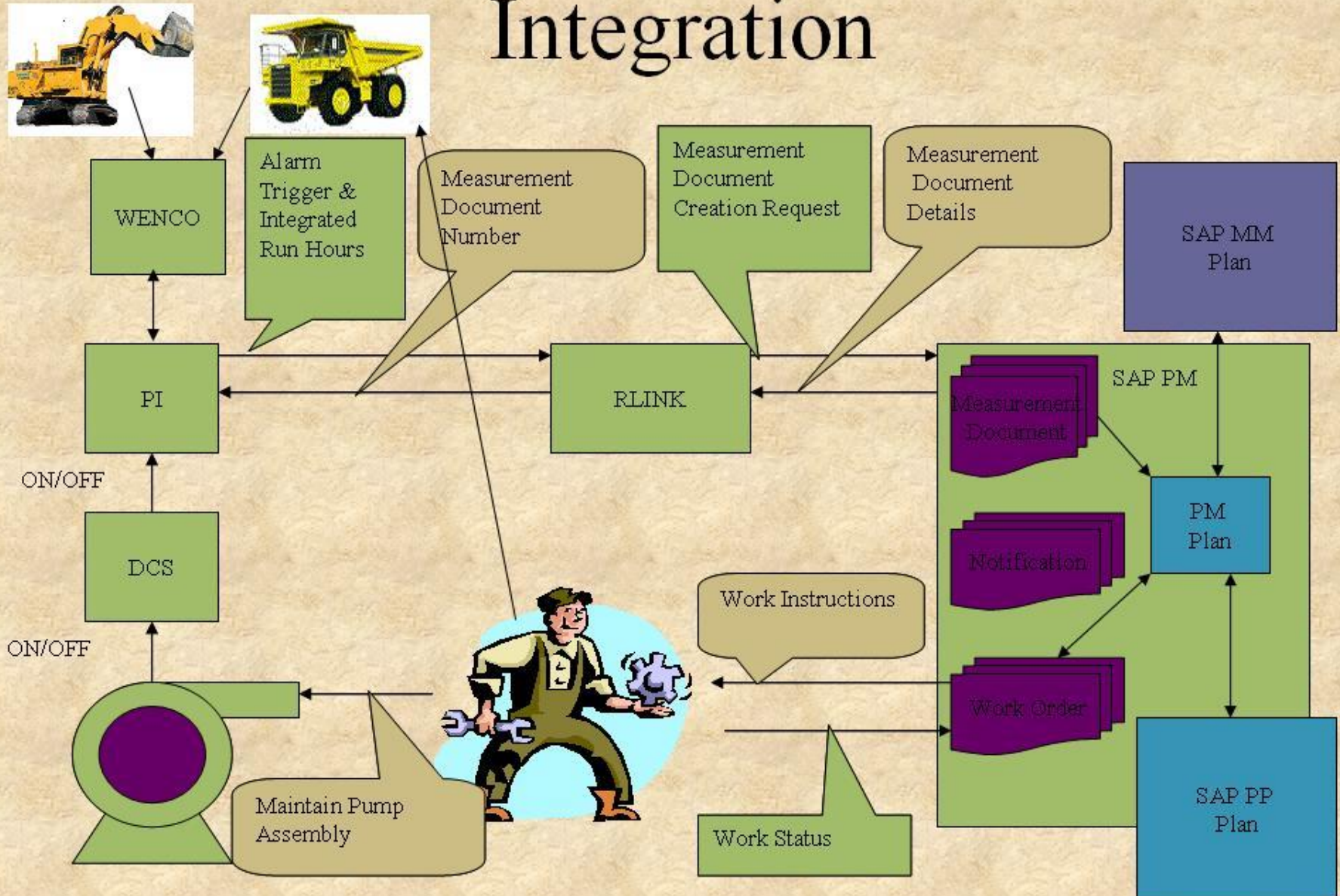
Maintenance Notification Integration



Systems Integration

- OSI PI to SAP PM Usage Measurement
 - Equipment usage totalized per day
 - RLINK PM monitors usage tags and creates measurement document for SAP PM Functional Location for Equipment based on periodic alarm trigger
 - Returns measurement document number to PI
 - SAP PM creates work orders based on measurement document information

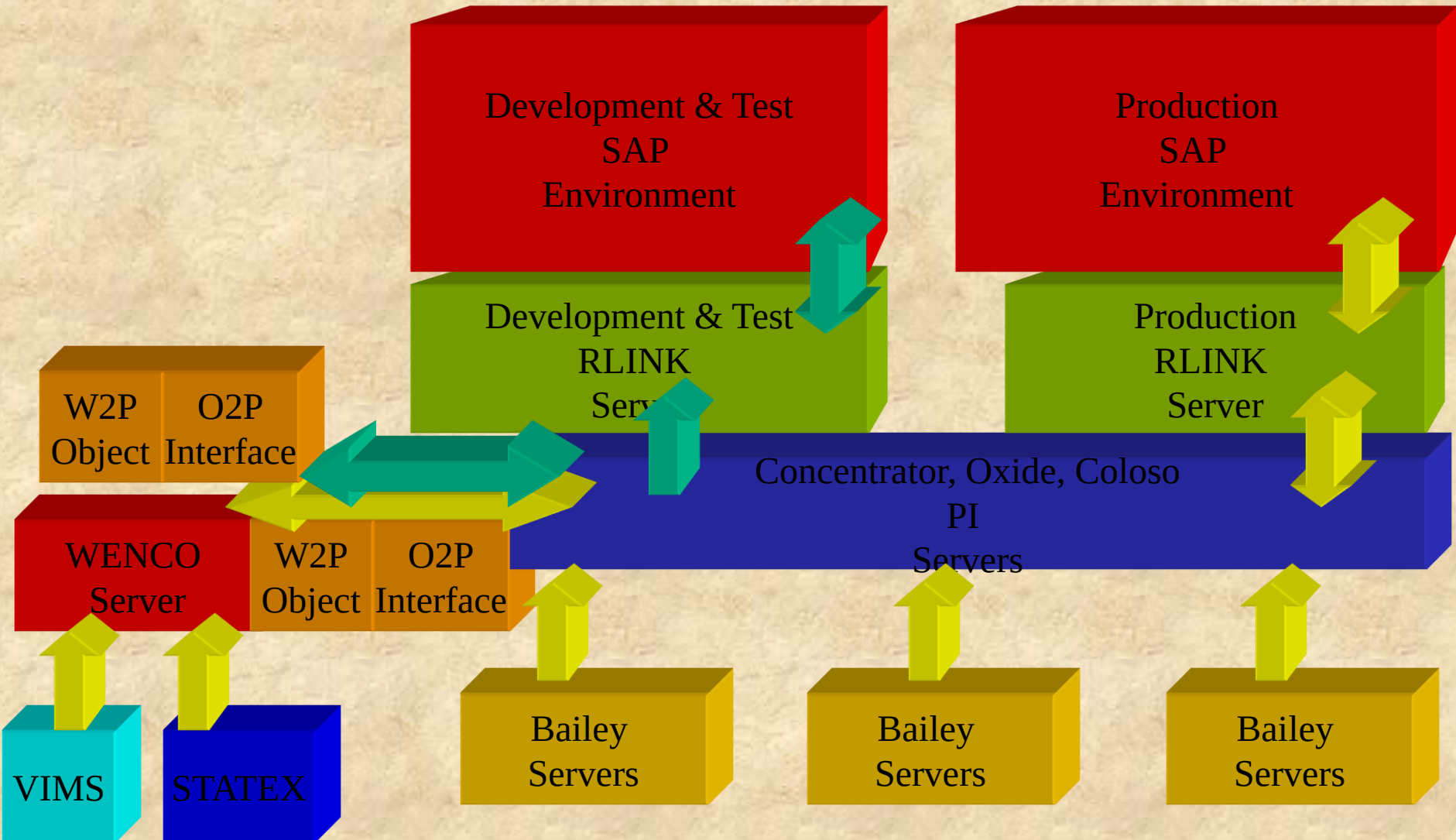
Maintenance Planning Integration



Implementation Plan

- Establish Requirements & Functionality Required
- Design the Integrated System
- Set up Development/Test Environment
- Design Pilot Configuration and Test
- Parameter Data Collection
- Design Configuration and Test all Parameter Data
- Set up Production Environment
- Transfer Configuration to Production
- GO-Live and Support!

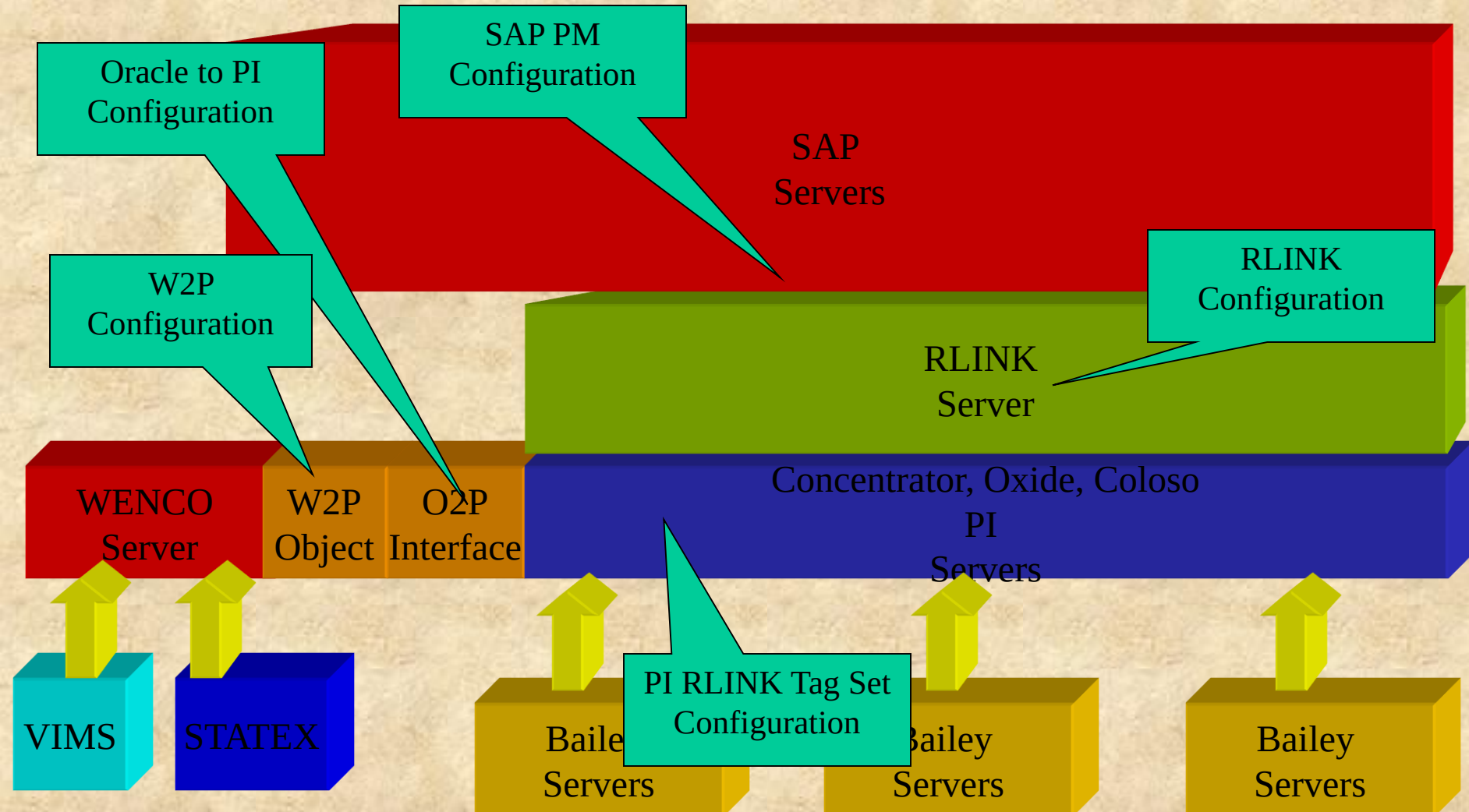
Environments



RLINK Implementation

- Configuration steps!
 - Identify Mine and Plant Equipment information sources
 - Create Wenco to PI Database
 - Configure Oracle to PI interface
 - Create unique RLINK tag sets for usages and notifications MINE and PLANT (alarms, value, description)
 - Create RLINK configuration for measurement and notifications linking tag sets to SAP PM Functional Locations

Configuration



RLINK Implementation

- Examples of configuration files!
 - Oracle to PI interface files – DAT and INI
 - Mine Tag files – General and Specific Tags
 - Plant Tag files – General and Specific Tags
 - RLINK Configuration Mine and Plant files

RLINK Implementation

- Test configuration
 - Configure SAP Test Environment
 - Test fire triggers and verify correct system functionality and data transfers
 - Load test the system by generating many transfers
- Training
- Go Live
 - Transfer configuration to Production Environment
 - Monitor and support system

RLINK Implementation

- Project Team
 - GSAP (Joe Gracia and team)
 - Escondida Team (PI Ramon, Wenco Arturo, IT Fernando)
 - OSI USA Support (Gretchen, Ajoy)
 - Hatch Integration (Cedric)

RLINK Implementation Tips

- Development/Test used for training
- Test all configuration changes on test system
- Test all s/w patches on test system
- Backup all systems regularly

Travel Tips

- Carry some extra clothes in your hand luggage
- Medicals, don't think your local doctor knows it all
- Don't assume anything, test and make sure