



“Taking on the World’s Toughest Challenges”

PI in the Upstream Oil & Gas Environment

Vince Roberts

Production Advisor

ExxonMobil Global Services Company

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Taking on the world's toughest energy challenges.

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Abstract

"Taking on the worlds toughest challenges – PI in the upstream oil & gas environment"

This presentation focuses on the key challenges and decisions made in order to shape PI to fit our industry-specific business needs. Current day operating examples are presented.

We will briefly review:

- System Deliverables : Business & Design Challenges
- Standard approach
- Current solutions
- Challenges remaining
- Our key focus area is "**Standardizing Calculations**"
 - What are our goals
 - Choice of deployment packages
 - Converting the Business Processes to logical PI Objects
 - Providing Robustness
 - Enabling Data integrity
 - Managing data buffering events
 - Moulding the packages to fit the purpose
 - Security and Controls
 - Remote Support

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for reference**



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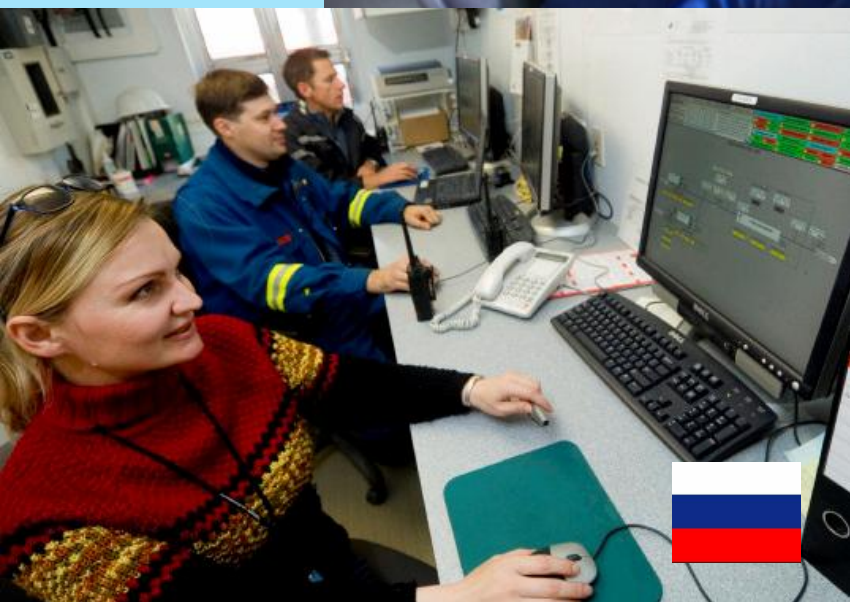
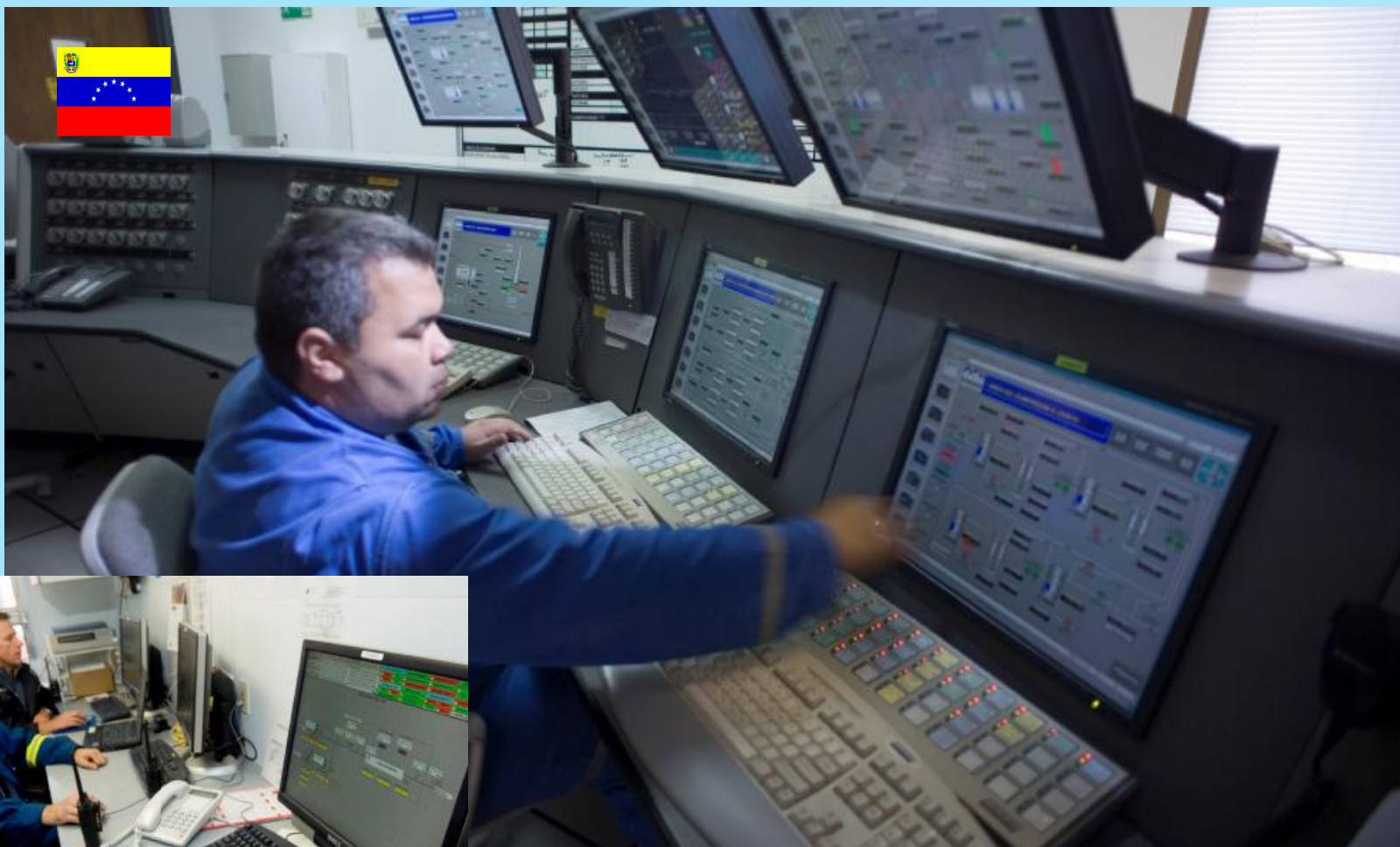
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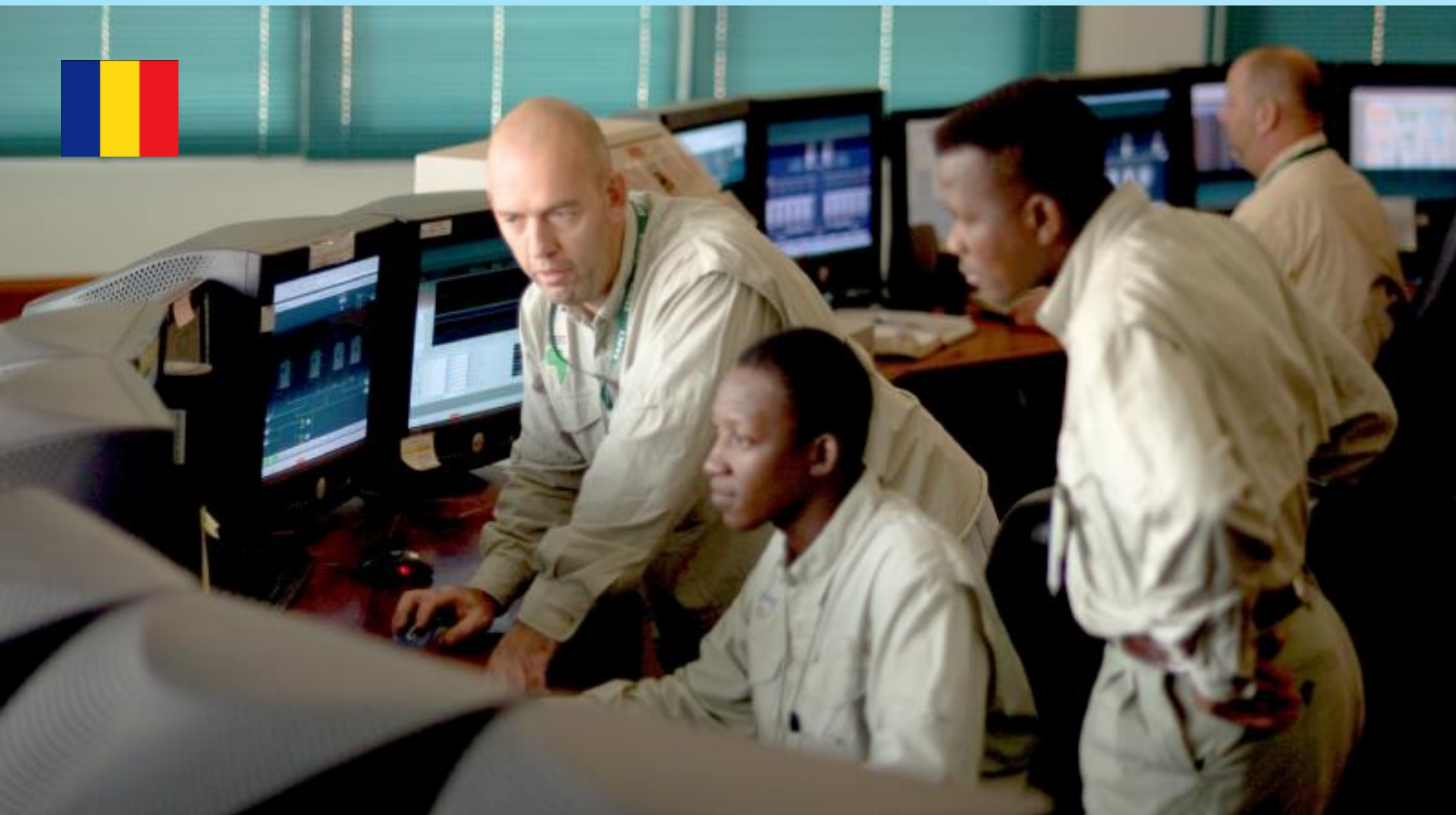
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Welcome Aboard !!!



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“Taking on the World’s Toughest Challenges” PI in the Upstream Environment

1. System Deliverables - Business & Design Challenges

2. Standard Approach

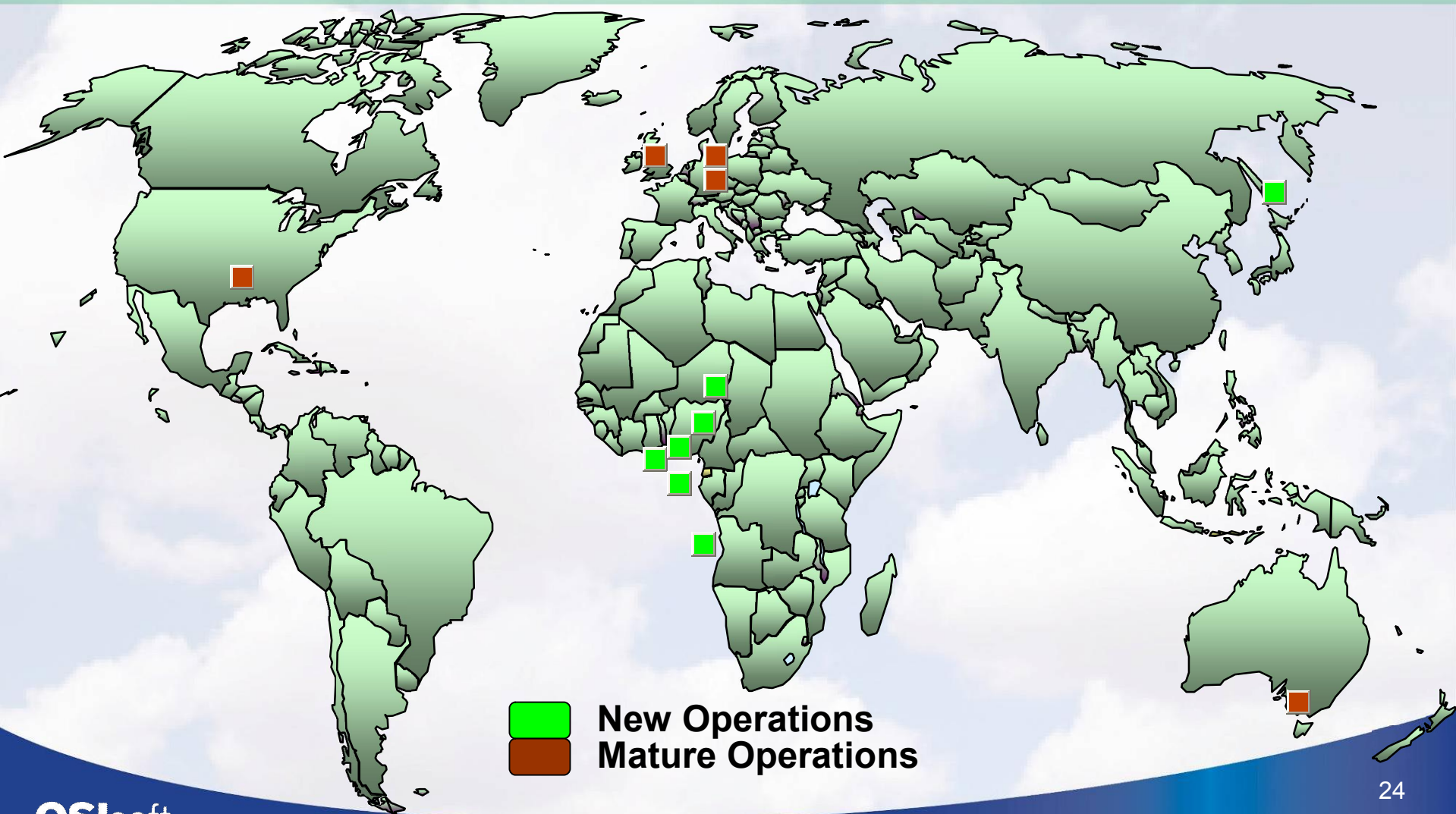
3. Current Solutions

4. Challenges Remaining

System Deliverables: Business Challenges



System Deliverables: Business Challenges



System Deliverables: Business Challenges



System Deliverables: Business Challenges



System Deliverables: Business Challenges

- Availability
 - Perform 24x7 surveillance for the life of the field
 - Uninterrupted real-time data to/from anywhere on the globe
- Data Integrity
- Support
 - Provide operations with quality 24x7 remote support
- Maintainability
- Security and Controls
- Streamlined Delivery Process

System Deliverables: Design Challenges

- Global standardization
- Network latency
- High Security
- Different control systems and interface capabilities
- Physically different operations
- Different engineering designs and country standards
- Mature or new operations
- Multiple time zones for applications and users
- Remote support



ANGOLA CAMEROON CHAD **NIGERIA** SAKHALIN EQUATORIAL GUINEA

NEW PRODUCTION OPERATIONS



Temperature	. C
Pressure	948. mB
Cloud Cover	. M
Visibility	. M
Vessel Pitch	. M

Longitude
Latitude



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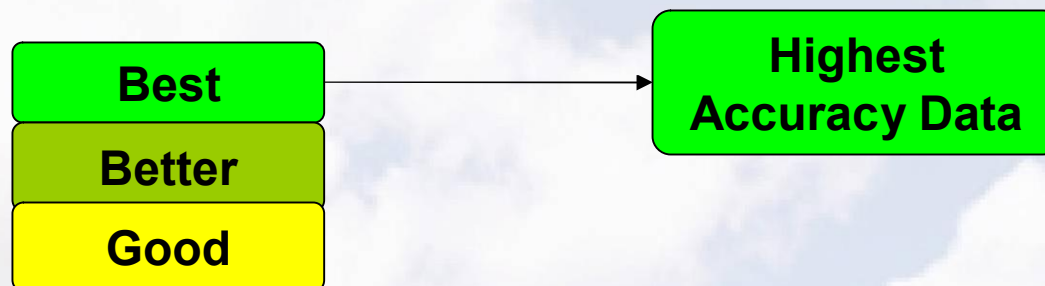
3. Current Solutions
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Standard Approach: Design Decisions

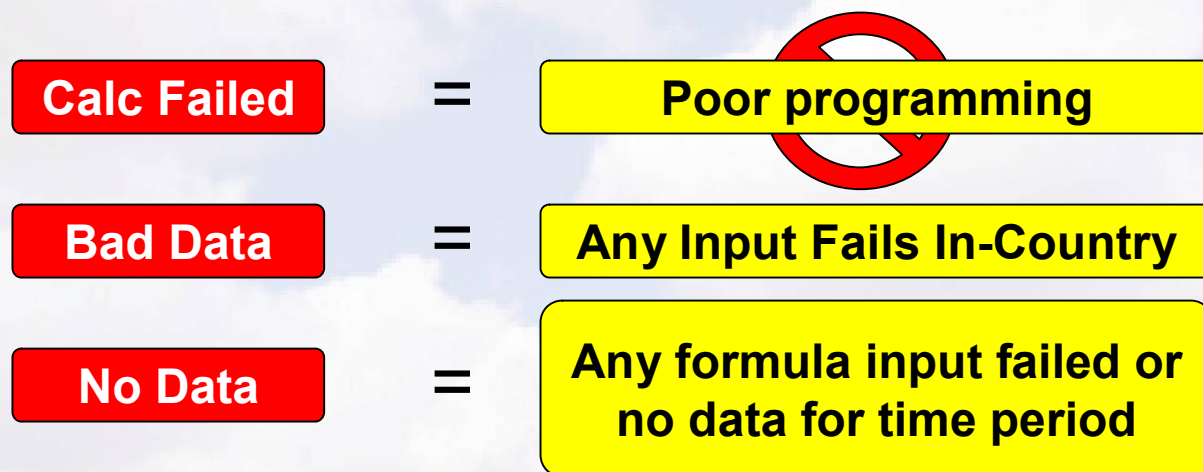
1 Flexibility

- Input/output systems are inflexible PI is the solution 
- BIG POSITIVE for PI. (API/SDK/VB/VBA)

2 Data Quality



3 Data Integrity



Standard Approach: Package Choice

Criteria	PE	API/SDK	ACE	ACE/MDB
Write to History				
Automatic Recalculation by group				
Tag Count Requirement				
Generic Modules				
Readability				
Cookie Cutter Design				
Guaranteed Execution Order				
Guaranteed Execution				
Vendor Support				
Quality Propagation				
Degree of Customization				
Support Experience				
Ease of Remote Support				

Standard Approach: Applications

ACE or ACE/MDB

API/SDK

Standard Approach: Structure

1

Properties

2

System Routines

3

Standard Output Tags

Standard Approach: Enhanced Calls

Either MDB , ACE , SDK or
internal Time Series Array access

Input Calls

Expressions

Mathematics

Engineering

Output Calls

Standard Approach: Design Rules

Rule

Reason

1

Where possible avoid Real-time Calculations.
Design to run “just-in-time”

Repeatable, DCS independent and avoids Buffering

2

Use Standard Modules for Data Manipulation

Standard calls are insufficient for our purpose

3

Reference MDB Generic Aliases/Properties

Properties never expire

4

Single Context, Multiple Sub-Modules

Bandwidth / Simplicity/ Self Maintaining

Standard Approach: Design Rules

Rule

Reason

5

Applications must support either Manual and/or DCS data inputs.

For required Flexibility

6

For Standalone VB applications, site-specific configuration is via Excel with export to flat text file.
If application can not find the flat-text file it self-initializes.

Simple to support

7

Applications must be remotely supportable (eg. Remote development laptop test back to Production in Nigeria)

Easier for Commissioning and Support

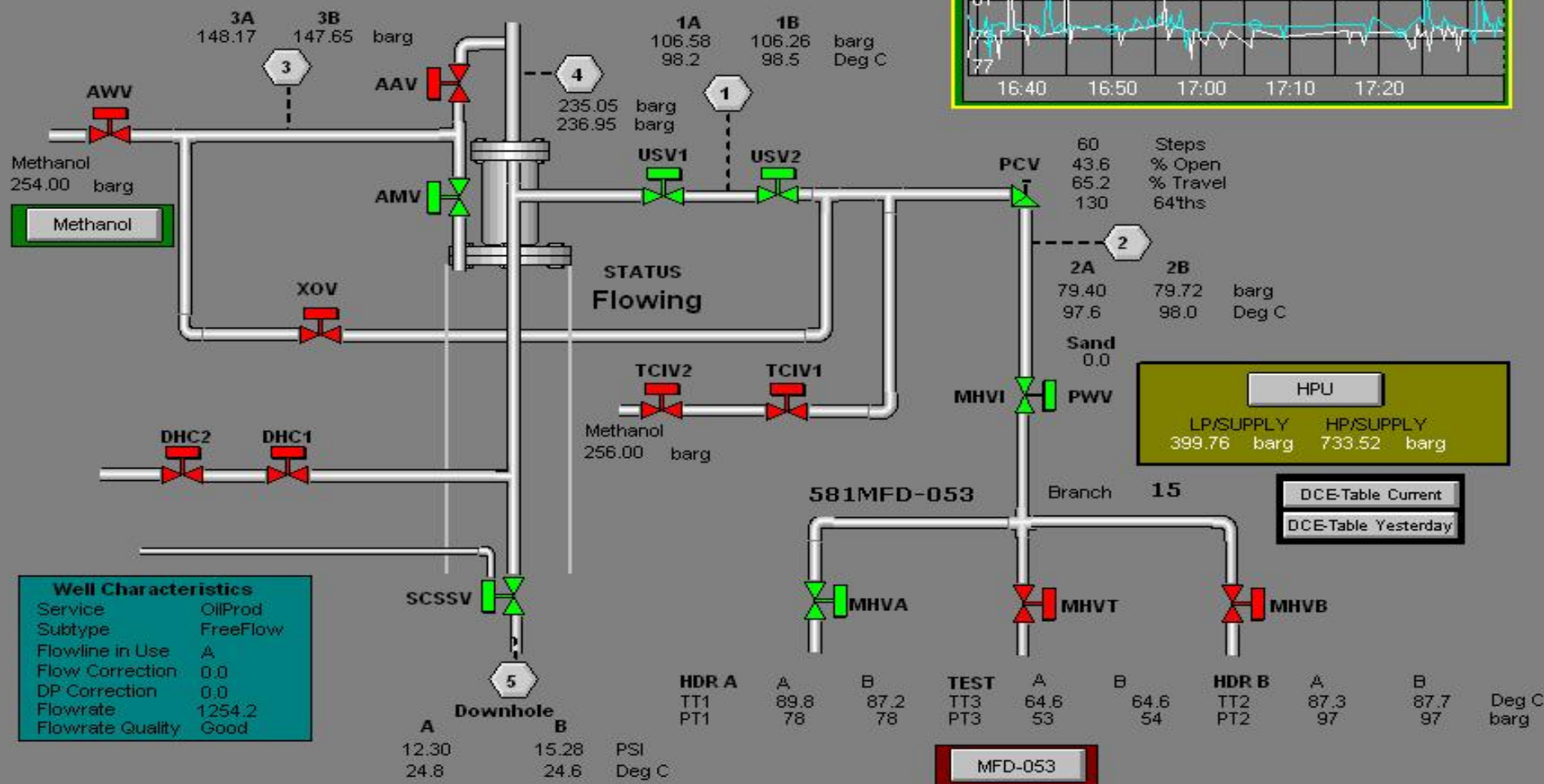
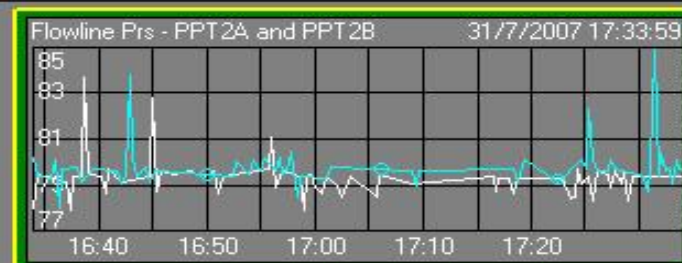
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4. Challenges Remaining

Current Solutions: Example 1 – Well - Process



ERHA PRODUCTION WELL X



Current Solutions:

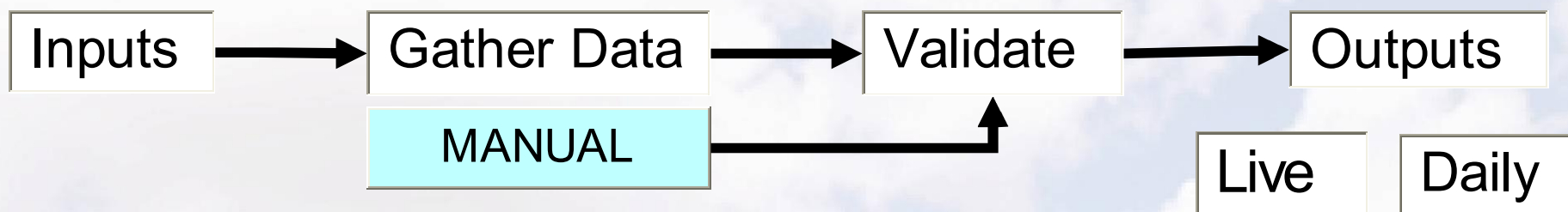
Example 1 – Well - Workflow

Country Specifics

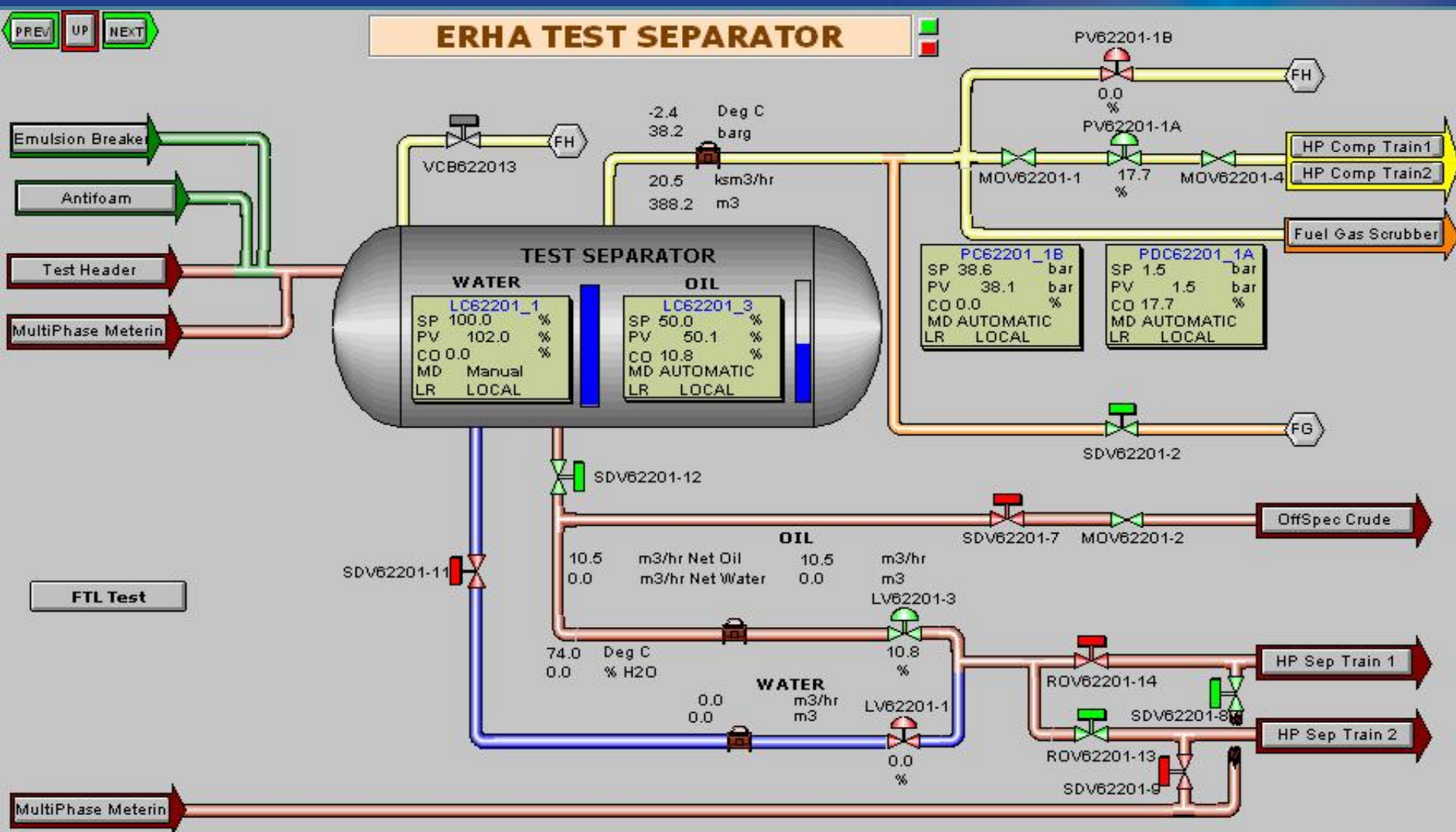
Well Service

Production Method

Other Properties



Current Solutions: Example 2 – Well Testing - Process



Current Solutions:

Example 2 – Well Testing - Workflow

Country Specifics

DCS Specifics

Separator Data

Separator Table

End Of Test

Gather Data

Validate

Outputs

Well Table

Well Data

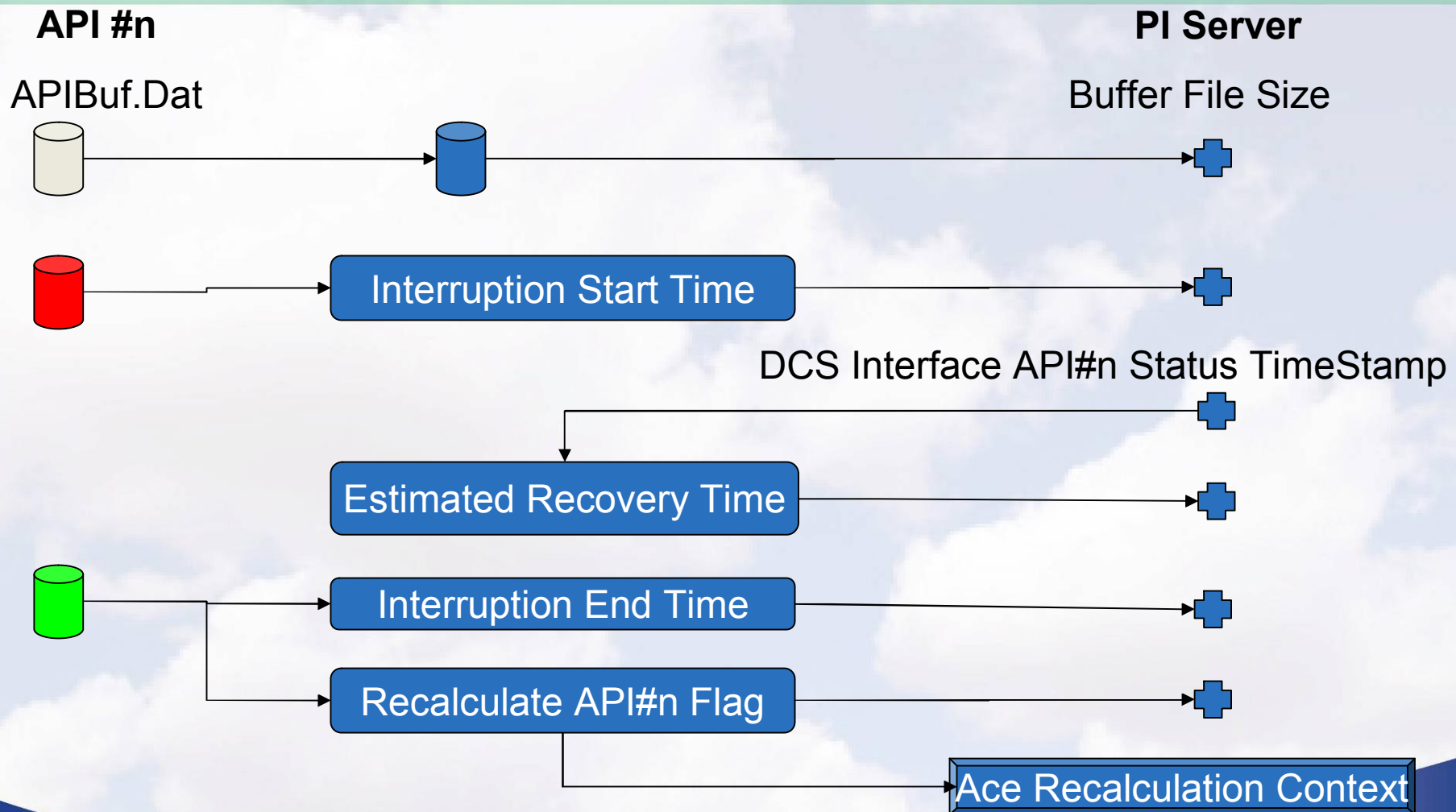
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“Taking on the World’s Toughest Challenges” PI in the Upstream Environment

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Challenges Remaining: Buffering



Challenges Remaining: Buffering

OSI Enhancement

- On reconnect from the API node to the PI server then :
“Asynchronously update the live snapshot whilst in the background recovering the buffered data”

Server Upgrade

- High Availability PR1 supports quicker Manual Buffering Processing. It's still manual intervention but at least we don't have to throw away data and a days reporting.
- "Interface Disconnected Startup"


Challenges Remaining: Security

OSI Enhancement

- Incorporate the mechanisms provided by Windows for authentication and authorization into the PI System architecture

Challenges Remaining: Remote Support

Hops	Nigeria	Ping Time
7	ERHA	736 ms



OSI Enhancement

Optimize support tools for minimal bandwidth

Better smarter faster SDK/API calls that packet more information into fewer network calls and process on the Server

Summary - Benefits

Category

Benefit

Remote Surveillance
and Support

- Safety
- Reduced personnel in-country
- Less travel costs

Global Standardization

- Significantly less design effort

VOYAGE2007

