



Transform Information into Intelligence

Presented by **Dan Lopez**

Transforming the value of data



Real-time Decision
Support



System
view



Individual
view



Local
view



Operation &
Business insight

Business/Operation
Intelligence



Group
insight



Enterprise
insight

How does the PI System enable transforming information into intelligence?



Capabilities

- PI Datalink
- PI Event Frames
- Future data (New)
- PI Integrator for Business Analytics (Coming)*
- PI Integrator for SAP® HANA® (Coming)*



Enabling Investigation

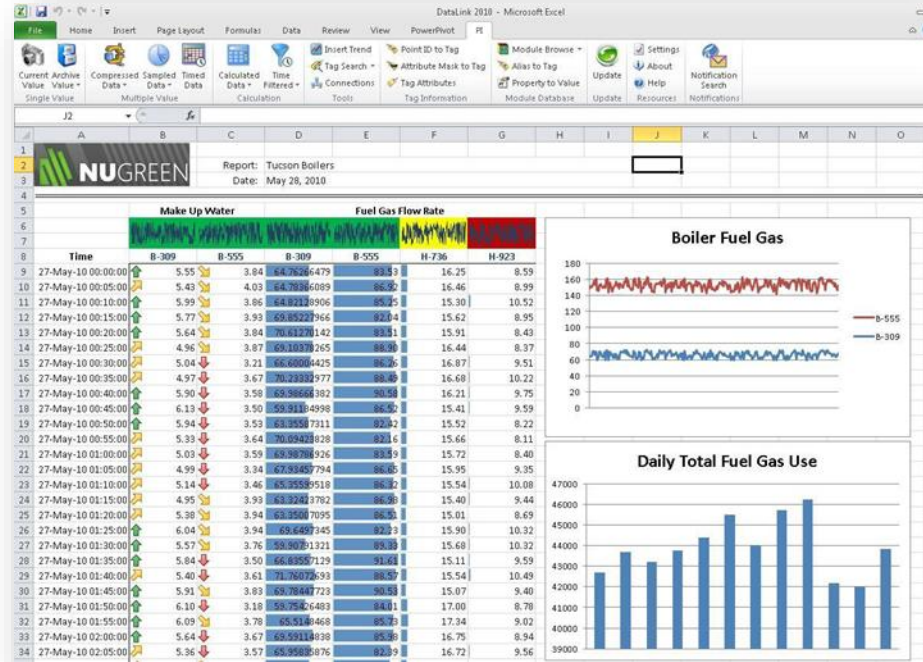
Asking How & Why: PI DataLink provides seamless PI System access within Microsoft Excel

Create novel insights

Perform rapid investigation

Add-in to Microsoft Excel

- Create Reports
- Apply Calculations
- Retrieve data



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2		AF Database	\\DFDELOREAN\Petrolux													
3																
4		Search Start	3/10/2014													
5		Search End	5/1/2014													
6		Event Name	*													
7		Event Template	*													
8		Element Name	*													
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Asking **How & Why**: PI Event Frames easily identifies events for deeper root cause investigation

- The most powerful way to automatically bookmark PI time-series data
 - Allows engineers and business users to derive meaning from their data
 - Simplifies searching, analyzing, and reporting

**Downtime
Excursion
Batch**

Related Data

Event Attribute	Value
Name	Ex 20141215-0002
Start	15-Dec-2014 10:35:02
End	15-Dec-2014 10:47:26
Duration	12 min, 24 sec
Asset	Boiler-352
Excursion Type	High Violation
Fuel Gas Flow Avg	37.12 k sft3/h
Fuel Start	823.48 k sft3/ton
myPIKPI Max	47.19 bbl/d

Asking **How** & **Why**: PI Event Frames are integrated across the PI System

Event detection
Root cause event
identification

**Event
Generation**

Hierarchical & batch
event generation

A scalable event
Infrastructure

**Event
Database**

Event storage
Related data
Calculations
Event auditing

Exploring & comparing
events in Excel
Ad-hoc reporting

**Event
Visualization**

Event trending
Root cause trending
Hierarchical trending
Event attribute visualizing
Event comparing

Reporting &
BI integration
3rd party integration

**Event
Integration**

SOAP access
Mobile app
compatibility
Programmatic access



Integrating Information to Drive Insights

Integration: What could you do if you knew the future of your...

PRODUCTION

Are we on track to hit our production targets?

Do the fiscal projections justify deviating from standard operation?

DEMAND

How much power will our customers need in the next 24 hours?

How much material are we obligated to deliver?

ENVIRONMENT

Are there enough units online to handle the storm?

Is there an abnormal heat wave that will compromise the grid?

Historical



0 1

Real-Time



Future Data



Integration: Integrate forecasts directly into your PI System

California ISO

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ABOUT US PARTICIPATE STAY INFORMED PLANNING MARKET & OPERATIONS RULES

Joining us

Going green

Looking ahead

Today's Outlook Mon Jun 1 08:54:06 2015

Current Demand: 26,827 MW Forecast Peak: 29,796 MW [Click for more](#)

Calendar News Releases Recent Documents

MONDAY, 06/1/2015
iCal 12:00 AM - 11:59 PM

TUESDAY, 06/2/2015
iCal 10:00 AM - 11:00 AM Peak Reliability Coordination
iCal 10:00 AM - 11:00 AM Technical Users Group

WEDNESDAY, 06/3/2015
iCal 10:00 AM - 11:00 AM Market Settlement User Group
iCal 1:00 PM - 3:00 PM Outage Management System Customer Panel

QUICK LINKS
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Business Practice Manuals
Careers
Tariff

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Alerts, Warnings and Emergency Notifications
Market Notices
Notification Signups
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California's Clean Energy Future
Market Participant Portal
eProcurement

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Facebook Twitter YouTube

Today's Outlook Mon Jun 1 08:54:06 2015

Current Demand:

26,827 MW

Forecast Peak:

29,796 MW

[Click for more](#)

Supply and Demand

Graph displays current system demand plotted against forecast demand and available resources. See tutorial for more information on this graph.

Current System Demand:

(Actual Demand at this point in time)

26827 MW

Today's Peak Demand:

(Highest point thus far today)

26827 MW

Today's Forecast Peak Demand:

(Highest point expected today. Does not appear post-peak.)

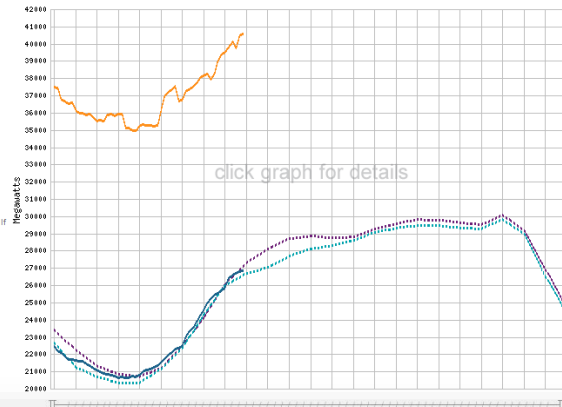
29796 MW

Tomorrow's Forecast Peak Demand:

(Not included on graph)

29683 MW

Information is current as of 01-Jun-2015 08:50. If browser does not support auto refresh, select reload.



■ ■ ■ Day-Ahead Demand Forecast

■ ■ ■ Hour-Ahead Demand Forecast

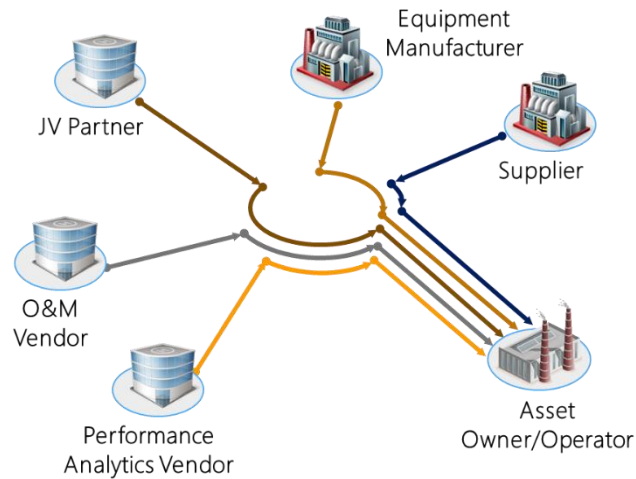
— Actual Demand

— Available

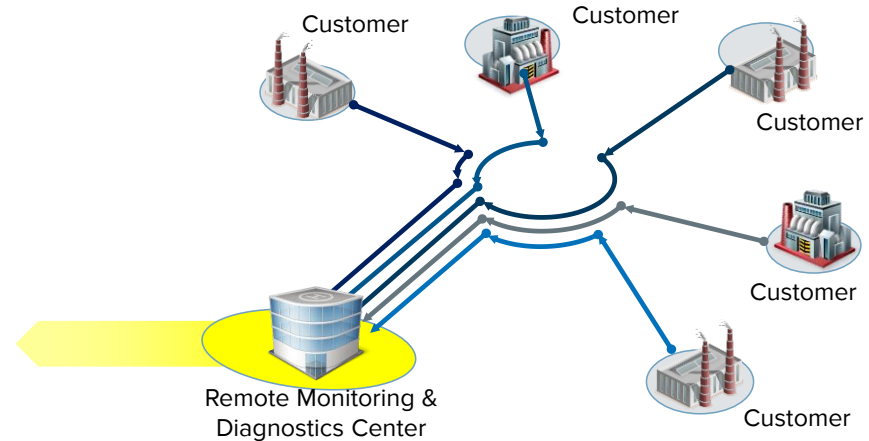
Hour: Beginning
■ ■ ■ Day-Ahead Demand Forecast ■ ■ ■ Hour-Ahead Demand Forecast — Actual Demand — Available Resources

Integration: Leverage external expertise to deliver intelligence with Connected Services

Multiple stakeholders...

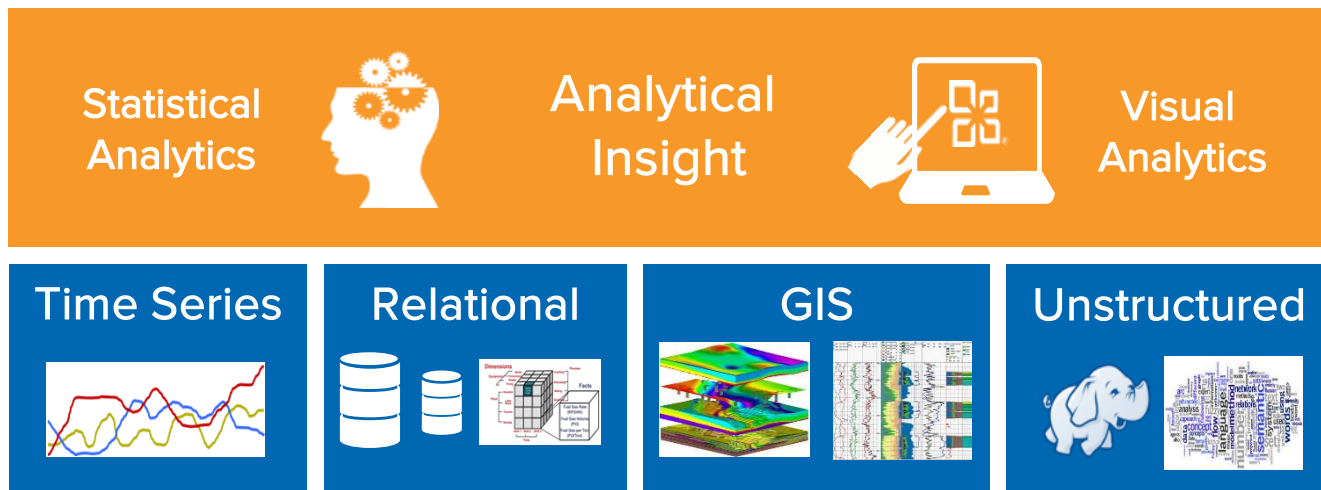


... a Service Provider perspective



Connected Services is a simple, secure, technical and **commercial framework** for **service providers** to obtain the data they need to drive service excellence

Integration: Derive Big Data insights and intelligence from your PI System data



The Internet of Things Creates Big Data

The PI System let you Leverage Big Data for Insights

Integration: Employ PI Integrators to gain Business Intelligence for the **Physical** World

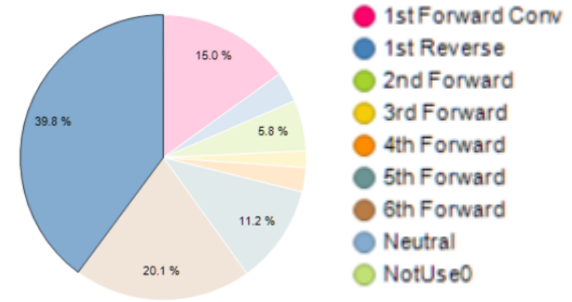


3 Contexts / 3 Perspectives

- Time-series: Time Focus
- Assets: Equipment Focus
- Events: Event Focus

PI
Integrators

Gear Select by Operator



2015-04-23 15:59:50	23.6547420812366	23.2147636153275	28.3663721651326
2015-04-23 16:00:00	23.6547420812366	23.2147636153275	28.3663721651326
2015-04-23 16:00:10	23.6547420812366	23.2147636153275	28.3663721651326
2015-04-23 16:00:20	23.6547420812366	23.2147636153275	28.3663721651326
2015-04-23 16:00:30	23.6547420812366	23.2147636153275	28.3663721651326
2015-04-23 16:00:40	23.6547420812366	23.2147636153275	28.3663721651326
2015-04-23 16:00:50	23.6547420812366	23.2147636153275	28.3663721651326
2015-04-23 16:01:00	23.6547420812366	23.2147636153275	28.3663721651326
2015-04-23 16:01:10	23.6547420812366	23.2147636153275	28.3663721651326

Integration: Overcome the challenges to discovering insights



Increasing systems
complexity



Scarcity of domain &
industry **expertise**



Cost and resource
constraints



Not everyone has direct access to information, leaving
many potentially **impactful** insights **undiscovered**

Noble Energy presents on the value of integrating data

Our Approach Data as a Strategic Asset

Gain New Insights Into Production Dynamics

- Across a wide variety of disparate data sources and variables such as well information systems, SCADA data, sensors, and unstructured data

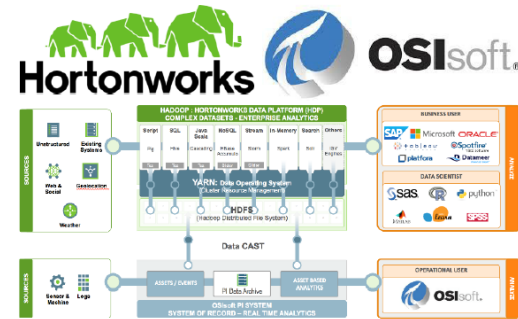
Build Executive Consensus and Business Sponsorship

- Start with a single business unit – prove the value
- Recognition that data provides sustainable competitive advantage
- Widespread, systemic value creation because data is managed as professionally as capital or labor

Rely on Trusted Partners to Assist

- Combination of Noble team members along with Hortonworks (Hadoop) and OSIsoft (PI / CAST)
- High performing operational and data science team (Python)

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Devon presents on data integration

What do we gain?

- BI tools become more responsive (Spotfire)
- Users can build queries ad hoc (SQL)
- Scheduled and ad-hoc reporting (SSRS)
- Historical data available to existing BI tools
- Real-time data in Hadoop
- Align data for BI within a common time scheme
- Enable unique uses for real-time data



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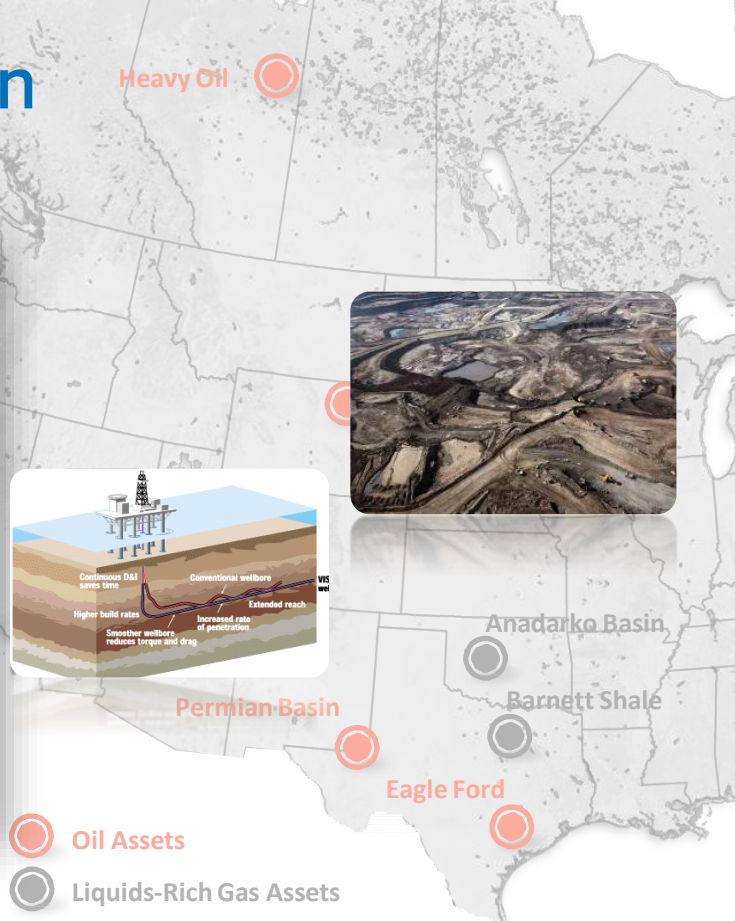
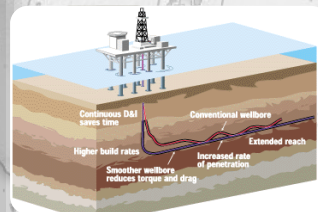
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Integration: PI Integrator Roadmap - Q3 2015

PI Integrator for Business Analytics: BI Edition

- Create PI Views
- Access decision ready data via ODBC
 - First class support for Tableau, Tibco Spotfire, and Microsoft BI (Excel, PowerPivot, Power View, Power BI)
 - Works with any software with an ODBC data source connection

PI Integrator for SAP® HANA®

- Automatically creates Virtual Tables via Smart Data Access (SDA)
- Native integration with SAP HANA
 - Linux and SAP HANA Cloud Platform
- Available through SAP

Novel and Actionable Insights

**BUSINESS
PROCESSES**

Advanced
Visualization

Advanced
Analytics

SAP HANA

**INDUSTRIAL
PROCESSES**



Real-time
Decision Support



Real-time Business
Decision Support



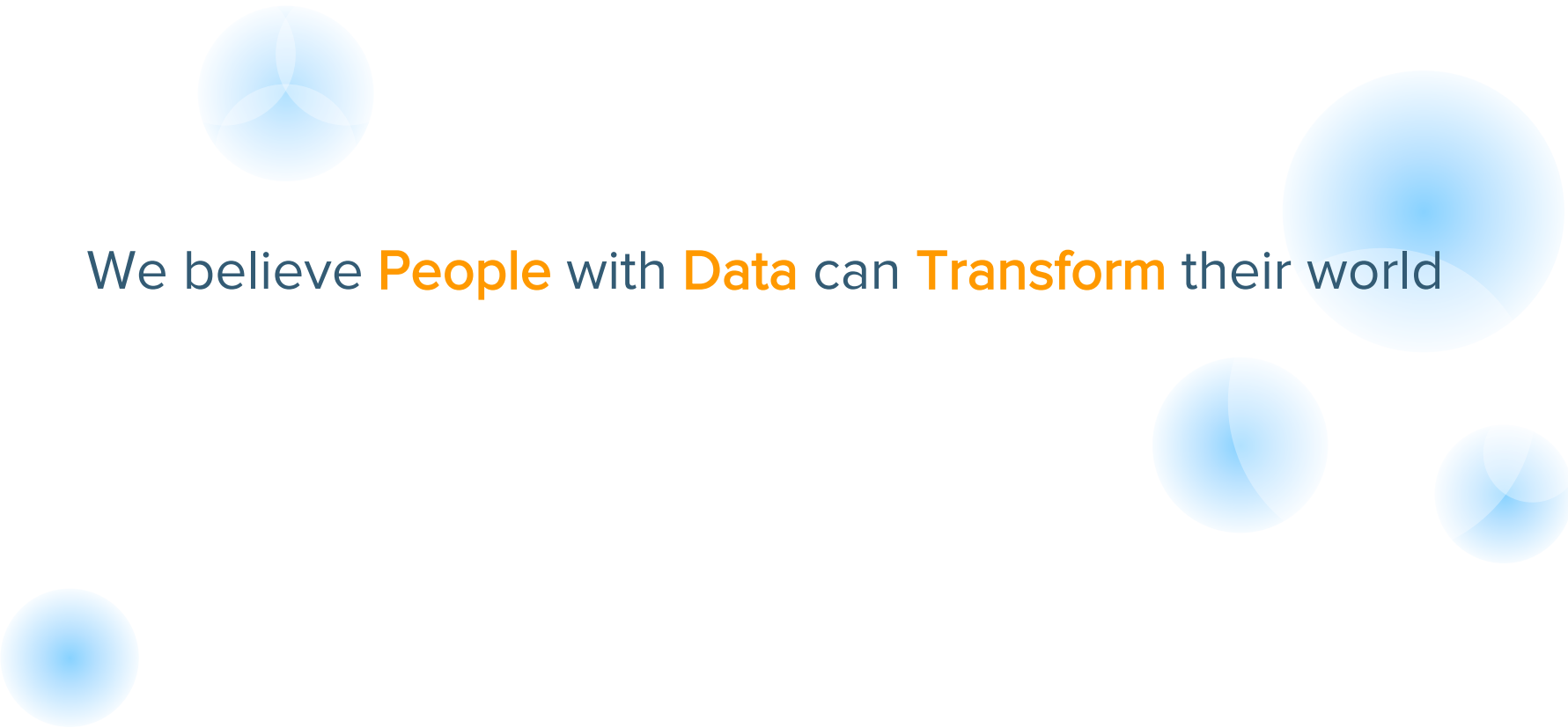
Cybersecurity

OSIsoft®

Real-time Operational
Decision Support

soft.

Operational
Support

The slide features several decorative blue elements: a large sphere with three overlapping circles inside in the top left; a large, semi-transparent sphere on the right side; a medium sphere below it; a small sphere at the bottom left; and another small sphere with three overlapping circles inside at the bottom right.

We believe **People** with **Data** can **Transform** their world

Transforming the value of data



Real-time Decision
Support



System
view



Individual
view



Local
view



Operation &
Business insight



Group
insight



Enterprise
insight

Business/Operation
Intelligence

감사합니다

谢谢

Danke

Merci

Gracias

Thank You

ありがとう

Спасибо

Obrigado



Questions

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microphone before
asking your question

Please state your name
and your company



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Bring your questions, comments, and suggestions!

