



# *The Value of SCADA Data*

*Mark Michalski*

# What is PI worth???

ENBRIDGE PIPELINES INC.  
AUTHORITY FOR EXPENDITURE

AFE No.: 20001134XXX  
Page 3

Continued reliance on the pilot system will result in the need for further customization and burdening of the existing system that will result in further data integrity errors as well as limit the number of users and limit business areas from achieving the requirements noted above.

SUMMARY OF ESTIMATED COSTS	APPROVED CAPITAL BUDGET	PREVIOUS APPROPRIATION/ AFE	THIS APPROPRIATION/ REVISION	TOTAL AFE
TOTAL AFE DIRECT COSTS				
PROCESSING FEE				
AFUDC				
<b>TOTAL</b>		0	0	

INITIATED: Scott Cook 03/27/2000 APPROVED: Danny O. Sumors 03/29/01  
C. Budget 03/24/2000

REVIEWED: Pam Mitter 03/24/2000 APPROVED: WMS 00-04-03

FEET CODE	DESCRIPTION AND QUANTITY	CONTRACTS	ESTIMATED AMOUNT	CONTRACT	CAPITAL BUDGET	TOTAL
	65,000 Point PI License		250,555		36,000	286,555
	16 PI API Licenses		69,255		5,125	84,380
	PI Process Book		29,750		2,000	31,750
	PI DataLink		29,749		5,000	34,749
	OSI Support Contract		25,142			25,142
	Computer Hardware		126,000		12,000	138,000
	IBM PC/XT Support		20,000		2,000	22,000
	PCS - PI Connector		4,000		4,000	8,000
	Administration Tools		9,000		5,000	14,000
	Documentation & Training		19,200		1,000	20,200
	Consultation & Installation		14,000		2,000	16,000
	Consulting Labor		10,000		4,000	14,000
<b>TOTAL</b>		59,190	555,003	16,000	66,125	631,000

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C. Budget 03/24/2000

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WMS 00-04-03

# Outline

- Introduction to Enbridge
- Pressures Facing the Energy Industry
- Evolution of PI at Enbridge
- SCADA Data Uses
- Future Role of PI
- Benefits of SCADA Data Usage
- Where are we heading?
- Questions???



## Liquid Hydrocarbon Pipelines

- 15,000 km of main line pipe, spanning 4000 km
- 31 million barrels of tankage capacity
- throughput of 2 million barrels per day
- 75 different commodities
- 65 different shippers





## Gas Transmission & Distribution Interests

- 21.4% Alliance Pipeline
- 45% Vector Pipeline
- Enbridge Consumers Gas
- Enbridge Gas New Brunswick
- 32% Noverco Inc.





## SCADA Services

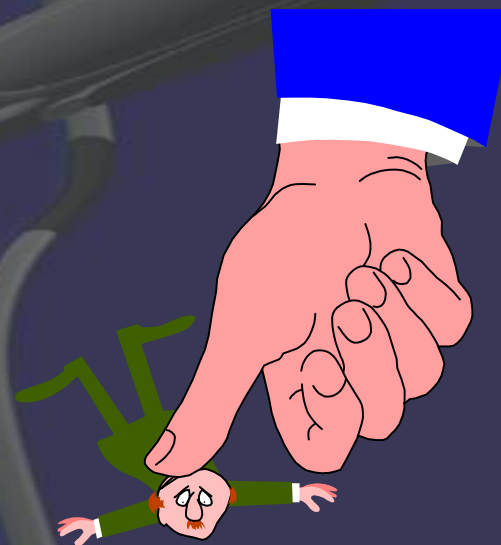
- Responsible for:
  - mainline liquid systems
  - 9 Tank Farms
  - Enbridge Consumers Gas
  - Vector Pipeline
- All controlled from Edmonton, Alberta



# Business Pressures

## Industry Trends

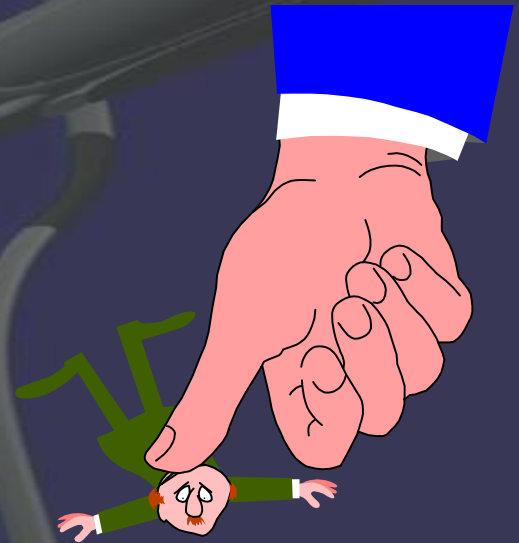
- Incentive Regulation
- Energy industry restructure



# Business Pressures

## Organizational Growth

- Mergers & acquisitions
- New development & Investment
- Centralized Control

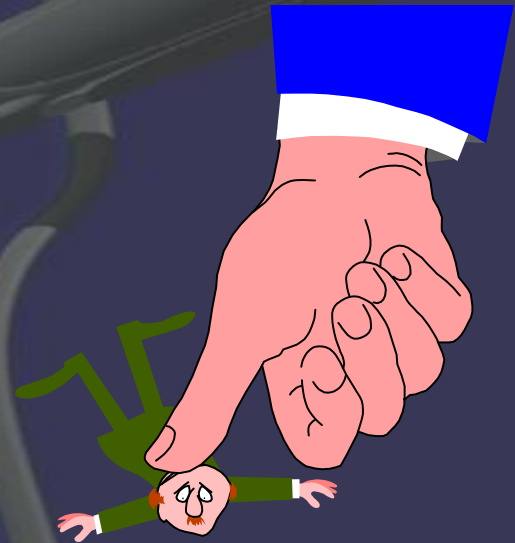




# Business Pressures

## Additional Factors

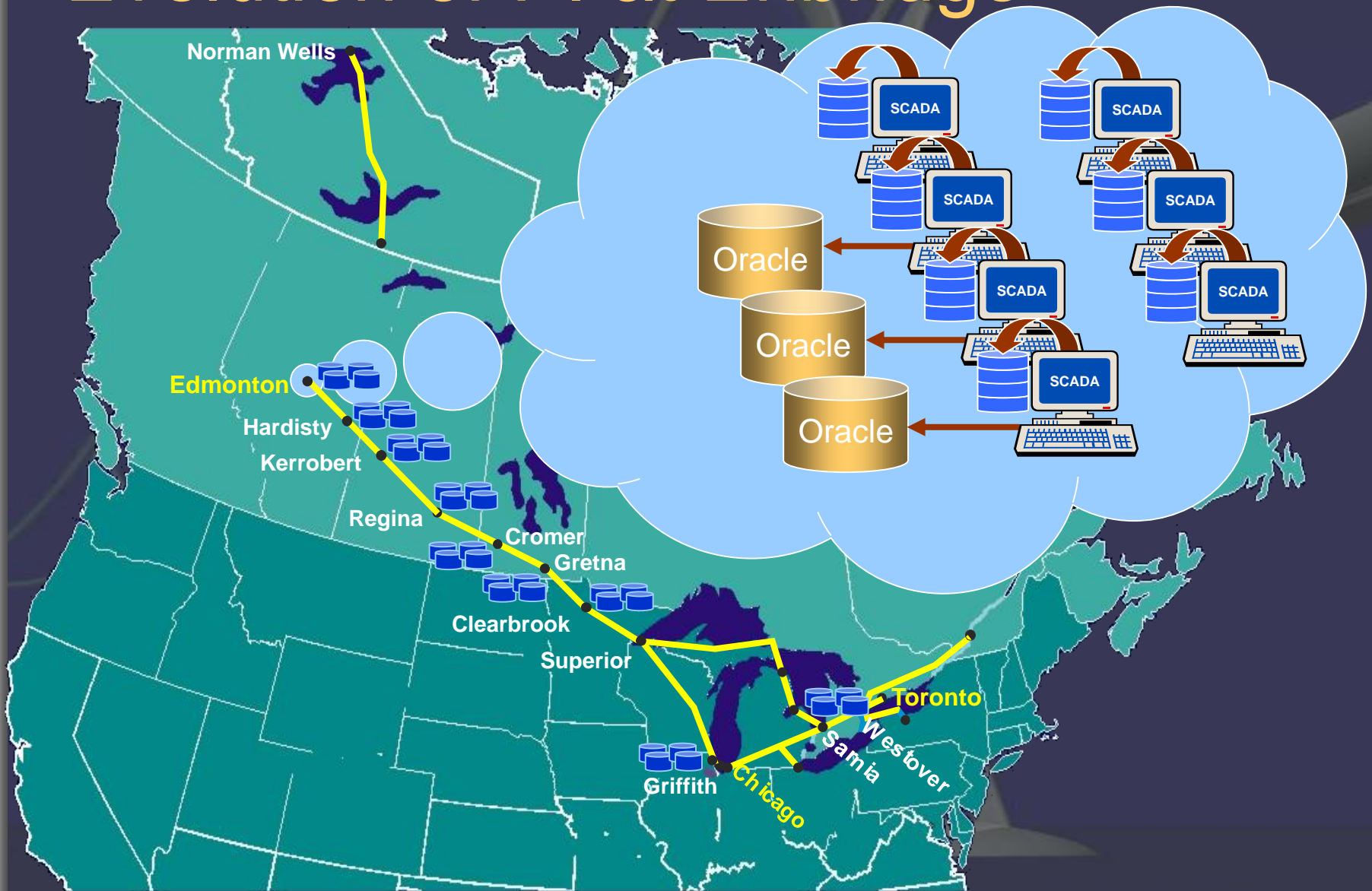
- More stringent regulations
- Aging pipeline infrastructure
- Rapid evolution of technology



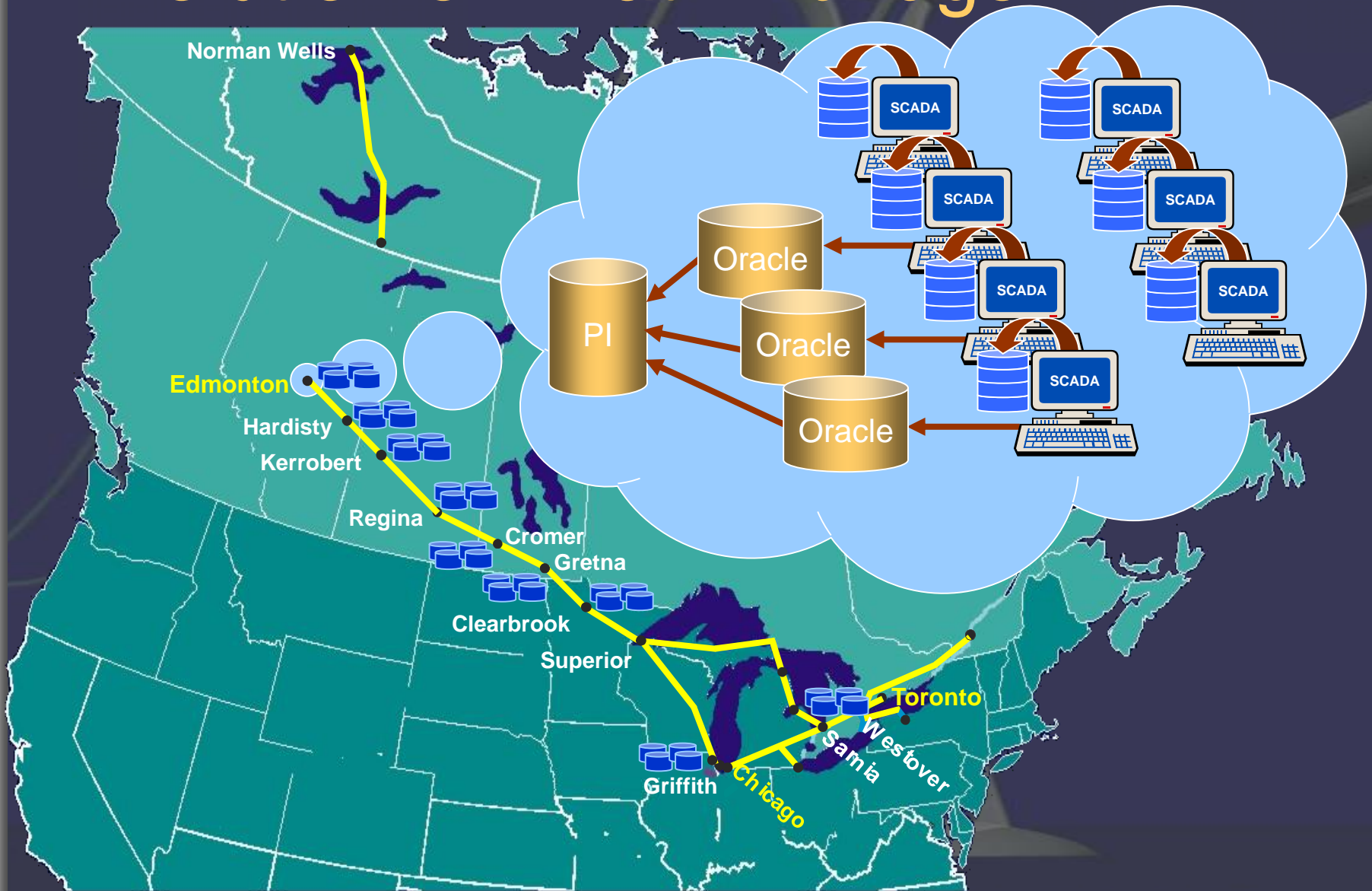
# Evolution of PI at Enbridge



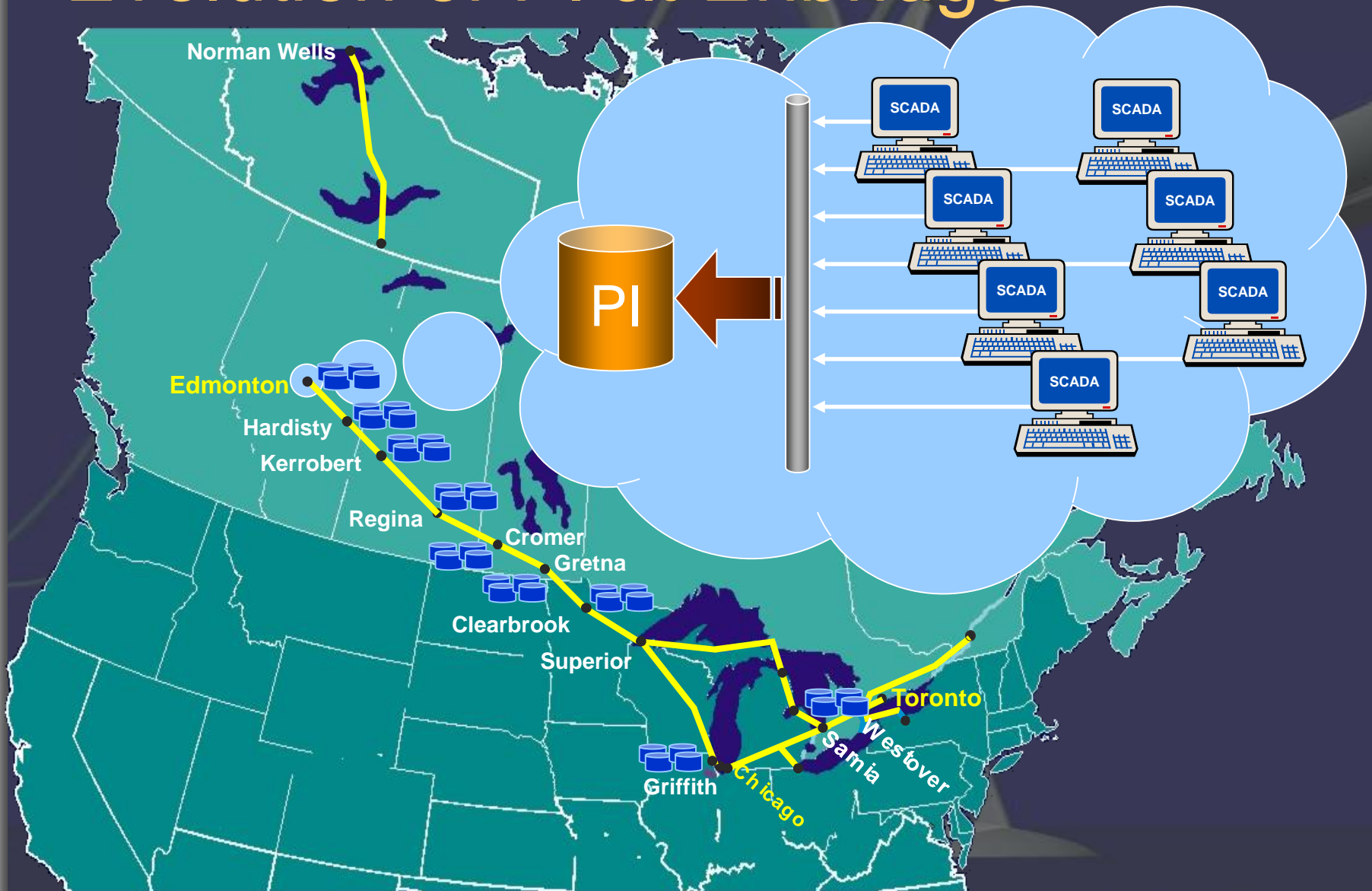
# Evolution of PI at Enbridge



# Evolution of PI at Enbridge



# Evolution of PI at Enbridge



# SCADA Data Uses

- Operations Monitoring
- Production Accounting
- Event Monitoring
- Asset Management

# SCADA Data Uses

## Operations Monitoring

- Track operating performance against fixed targets
- Analyze why you aren't on target
- Drives innovation



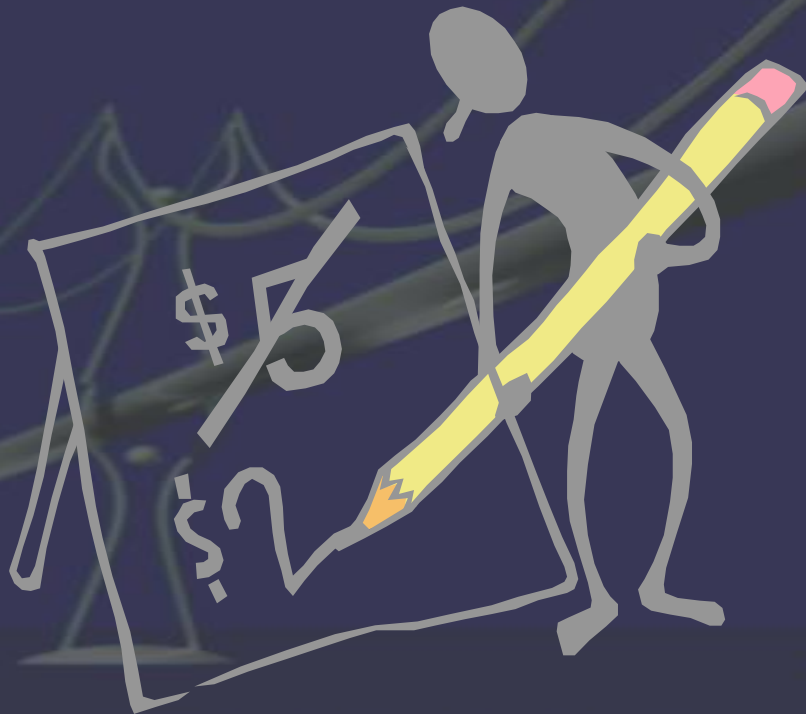




# SCADA Data Uses

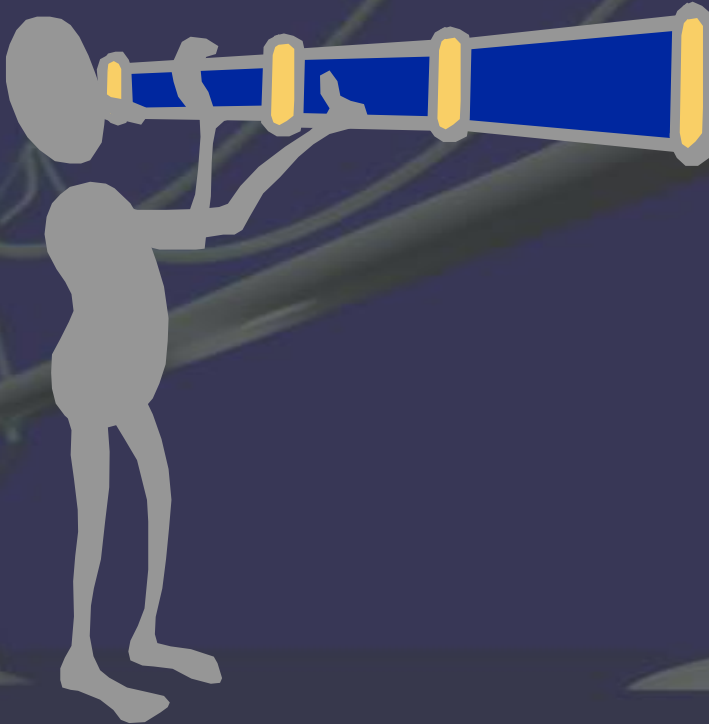
## Production Accounting

- Quickly & reliably produce balances using process data and share the results throughout the enterprise
- Includes:
  - Incentive Tolling Agreement
  - Energy usage authentication
  - Energy contract negotiations
  - Budget Process



# SCADA Data Uses

## Event Monitoring



- Detect, record and communicate operating events
- Includes:
  - Incident analysis
  - SCADA System Metrics

# SCADA Data Uses

## Asset Management

- Preventative Maintenance
  - Link with enterprise systems to track maintenance
  - link with Enterprise Resource Planning systems to deploy man power



# Future Role of PI

- Publish & Subscribe
- Material Balance System
- SCADA System Metrics
- Wireless SCADA Access
- Web based data access
- Replay incidents on Control System
- Preventative Maintenance

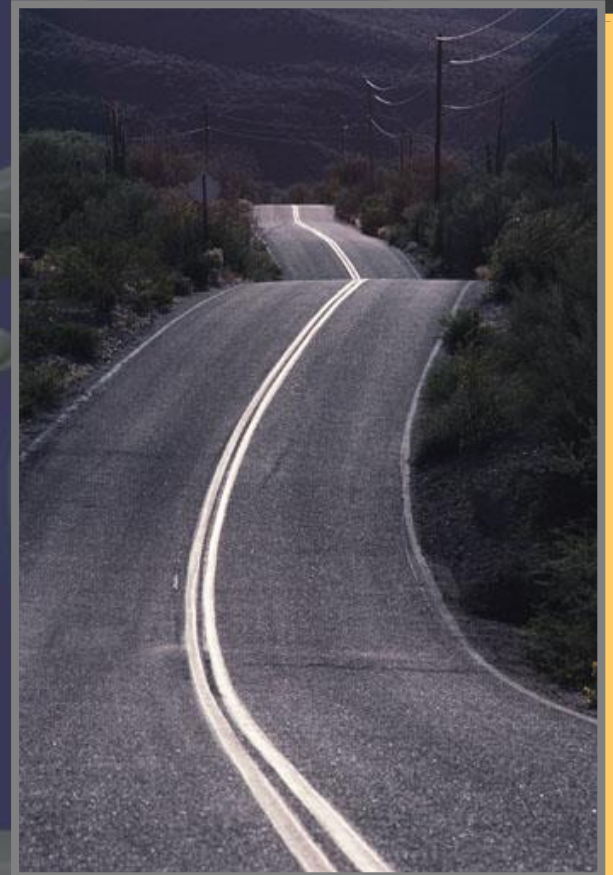
# Benefits

- Improved decision-making capability
- Increased flexibility & scalability of SCADA System
- Places SCADA data in the hands of the experts

# Where are we headed?

“Pervasive computing is convenient access to relevant information, - made readily available anytime, anywhere via mobile phones and other non-PC devices, within home or when travelling - and the ability to act on it wherever, whenever, however”

IBM Solution Partnership Center



# Questions???



E N S U R I N G   O U R   E N E R G Y   F U T U R E

# My Card



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# Corporate Profile

## Enbridge Inc.

### ENERGY TRANSPORTATION

#### Liquids Pipelines

- ▶ Enbridge Pipelines Inc.
- ▶ Enbridge Pipelines (NW) Inc.
- ▶ Enbridge Pipelines (Athabasca) Inc.
- ▶ Enbridge Pipelines (Saskatchewan) Inc.
- ▶ Enbridge Pipelines (North Dakota) Inc.
- ▶ Enbridge Pipelines (Toledo) Inc.
- ▶ Enbridge (U.S.) Inc.
- ▶ Lakehead Pipe Line Partners, L.P. (15.3%)
- ▶ Mustang Pipe Line Partners (30%)
- ▶ Chicap Pipe Line Company (22.8%)
- ▶ Frontier Pipeline Company (43.8%)

#### Natural Gas Pipelines

- ▶ Alliance Pipeline Limited Partnership (21.4%)
- ▶ Vector Pipeline Limited Partnership (45%)
- ▶ Cartier Pipeline – proposed (50%)

#### Other

- ▶ AltaGas Services Inc. (40%)
- ▶ Aux Sable Liquids Products Inc. (21.4%)

### ENERGY DISTRIBUTION

- ▶ Enbridge Consumers Gas
  - ▶ Gazifère Inc.
  - ▶ Niagara Gas Transmission Limited
  - ▶ St. Lawrence Gas Company, Inc.

- ▶ Noverco Inc. (32%)
  - ▶ Gaz Métropolitain and Company, Limited Partnership (77%)
    - ▶ Vermont Gas Systems, Inc. (100%)
    - ▶ TQM Pipeline and Company, Limited Partnership (50%)
- ▶ Enbridge Gas New Brunswick (63%)
- ▶ Cornwall Electric

### ENERGY SERVICES

- ▶ Enbridge Services Inc.
- ▶ Enbridge Services (U.S.)
- ▶ Enbridge Commercial Services Inc.
- ▶ NetThruPut Inc. (52%)

### INTERNATIONAL

- ▶ Enbridge International Inc.
- ▶ Oleoducto Central S.A. (24.7%)
- ▶ Enbridge Technology Inc.

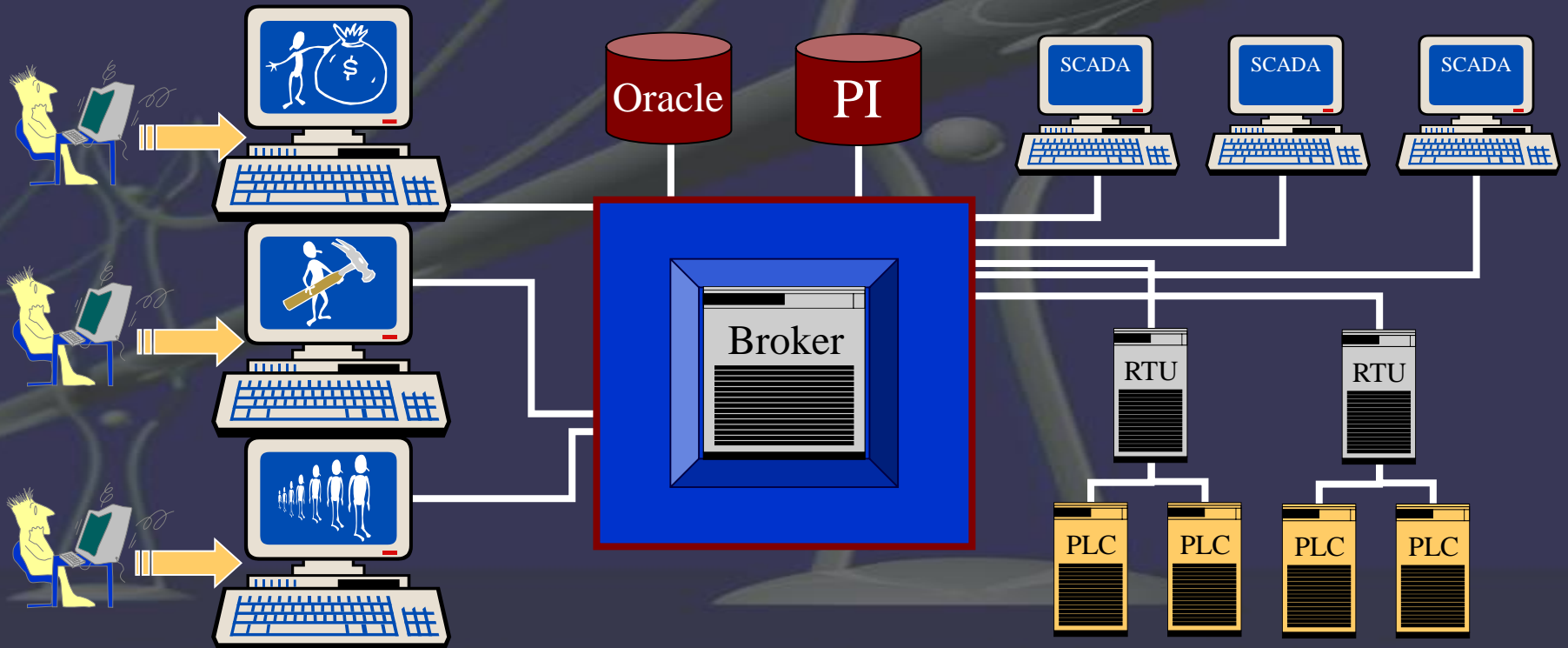
### CORPORATE

- ▶ Global Thermoelectric Inc. (strategic alliance)
- ▶ Inuvik Gas Ltd. (33 1/3%)
- ▶ Tidal Energy Marketing Inc. (50%)

# Publish & Subscribe



Data Access



ENSURING OUR ENERGY FUTURE