

# CREW

(Continuous Reliability Enhancement for Wind)

Database and Analysis Program

**Sandia Blade Workshop**

**July 22, 2010**

CREW Database Project Team

Bridget McKenney, Wind Reliability Lead

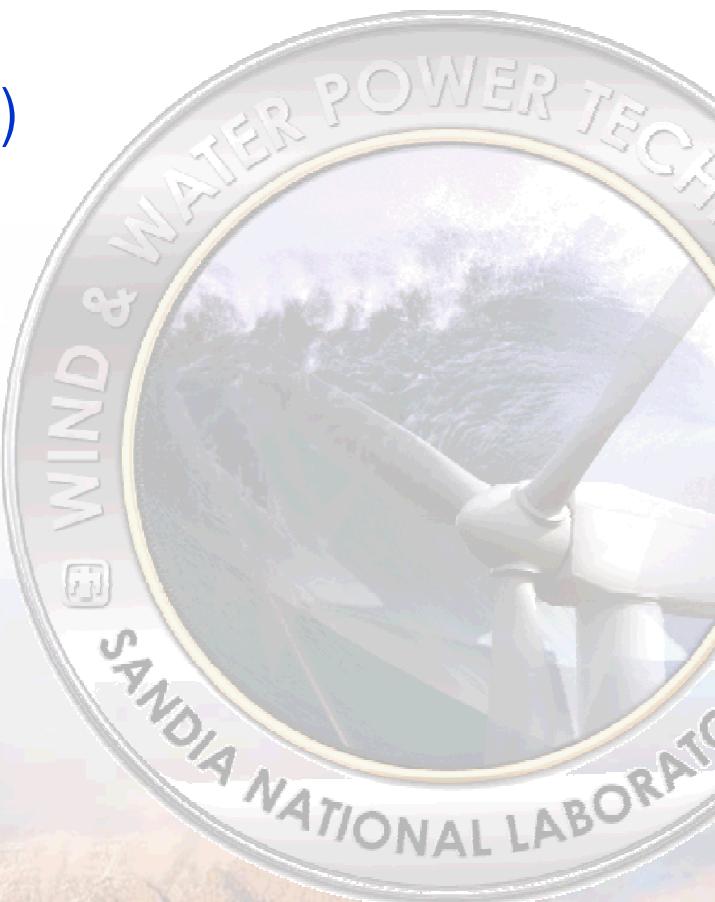
Alistair Ogilvie, Data Lead

Valerie Peters, Reliability Analyst

Wind & Water Power Technologies  
Sandia National Laboratories

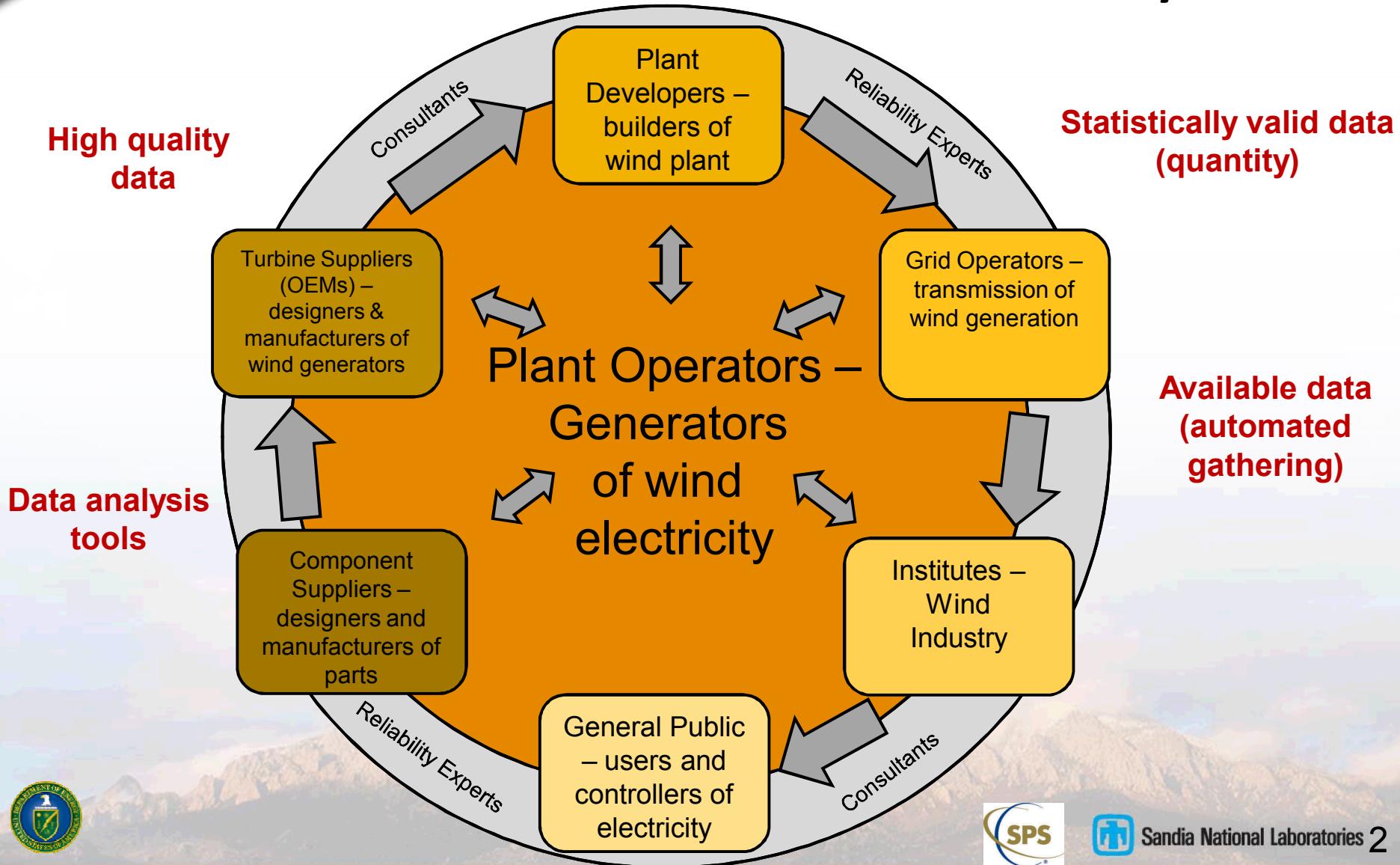


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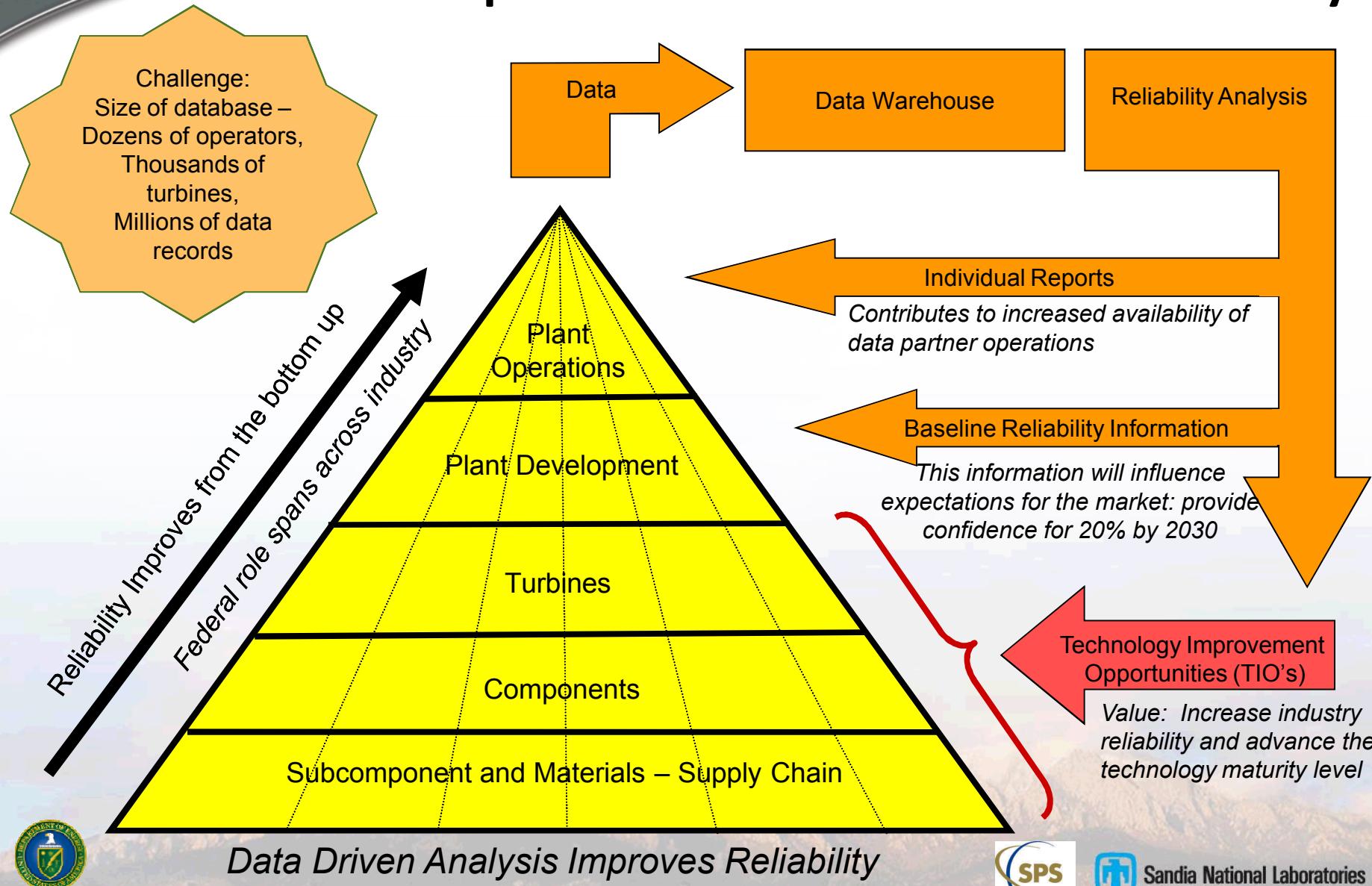


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# Operators are at the hub of all reliability activities



# A Comprehensive Data Model for Reliability



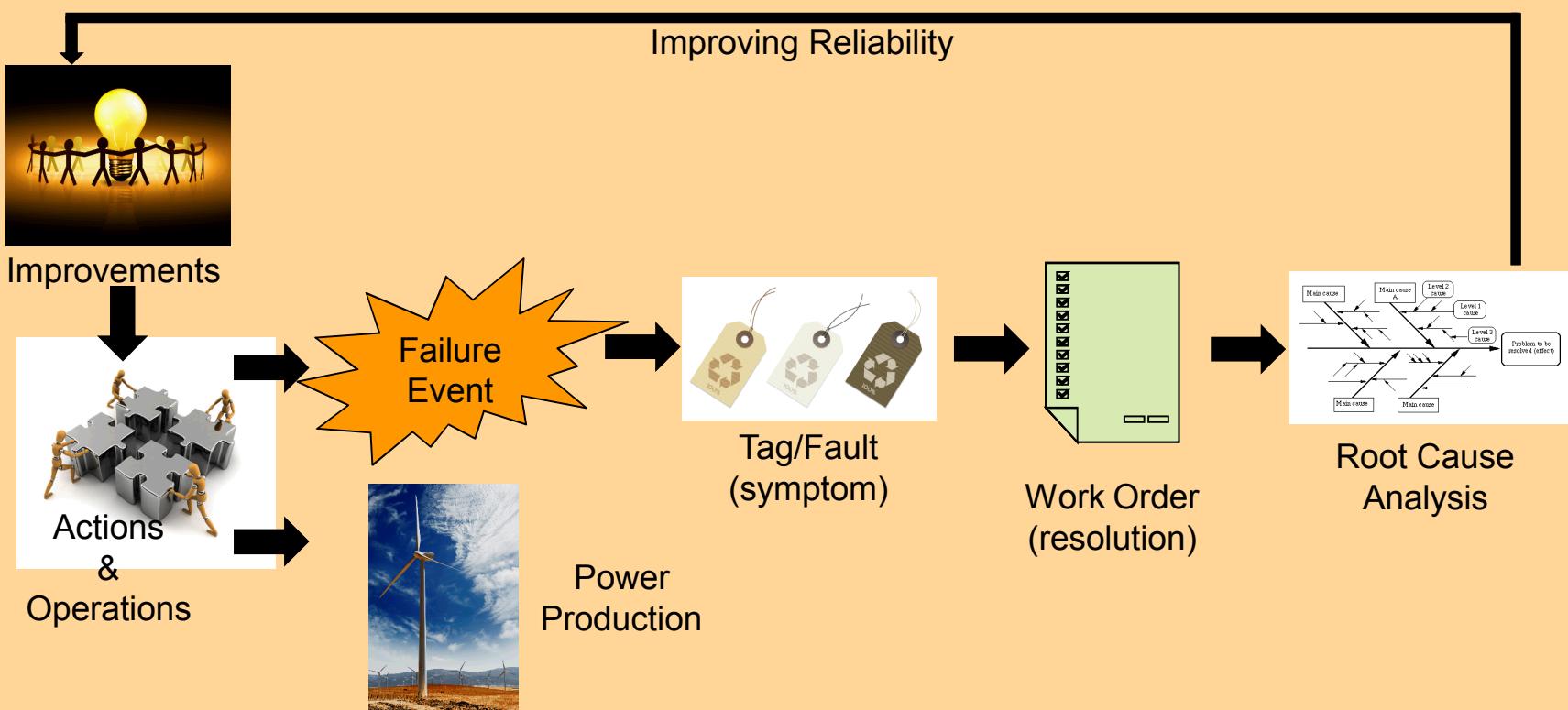
# A Feasible Future Scenario

Industry Aggregated Data / Benchmarks for US Fleet

Company-Wide Wind Plant Data: Single Owner/Operator

Wind Plant Data: Single Owner/Operator

Turbine Level



# CREW: Continuous Reliability Enhancement database for Wind

- Create national reliability database of wind plant operating data to enable reliability analysis
  - System, component, and part levels – identify root cause of failures
  - Identify issues and technology improvement opportunities
  - O&M cost reduction
  - Industry RAM benchmarks
- Protect proprietary information
- Increase confidence: financial sector and policy makers



# Industry Challenges

## Three types of data needed:

### ■ SCADA Data (time series and events)

- Lack of data consistency and completeness across SCADA systems

### ■ Maintenance Data

- Paper work orders not scalable to high volume data analysis; low deployment of CMMS systems and data historians

## Operational support and business growth

- Data support requires bandwidth from sparse internal resources
- Cultural: “just fix it” attitude
- Concern regarding sharing of proprietary data



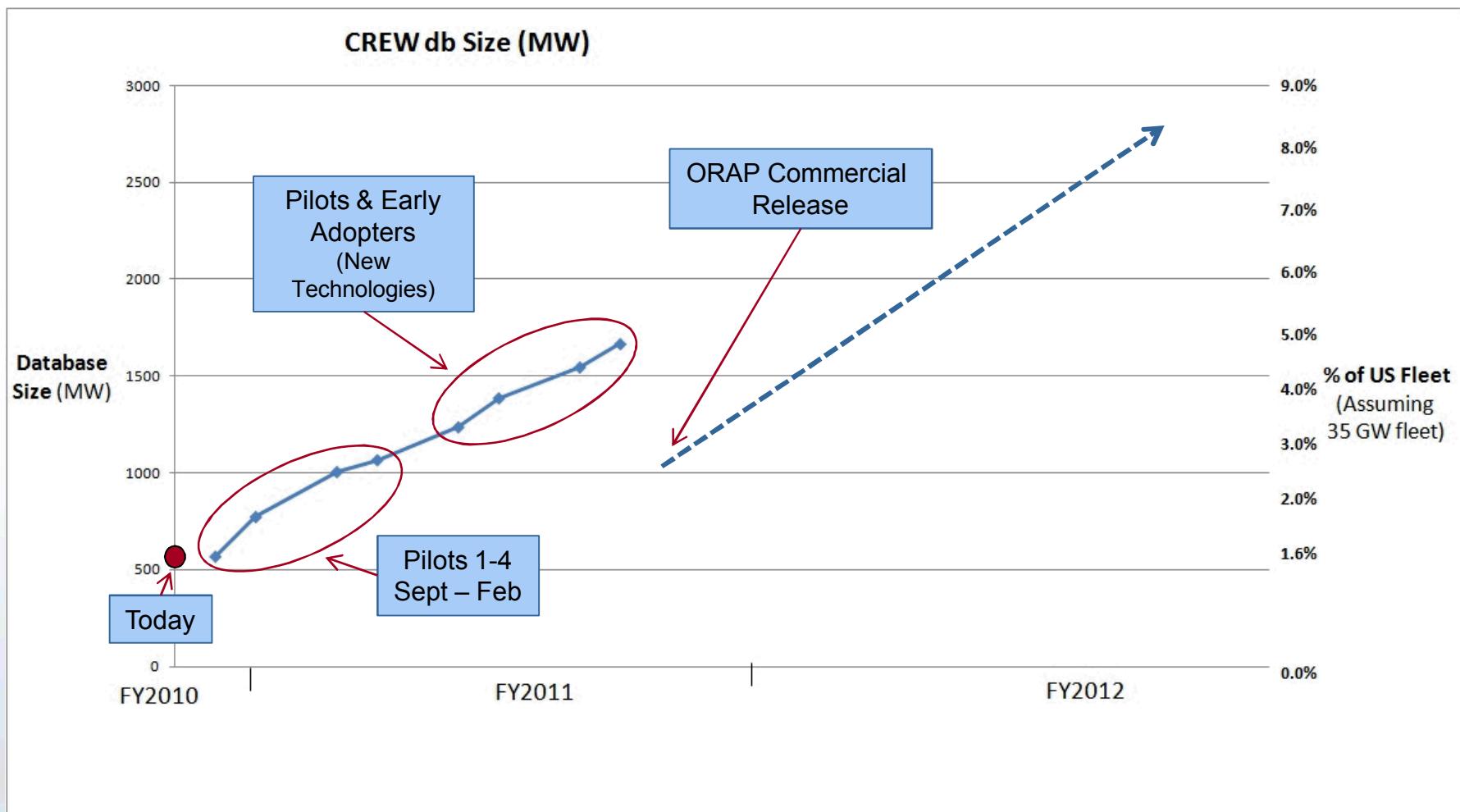
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# FY10: Partnership - Sandia & Strategic Power Systems (SPS)

- **SPS: a reliability engineering and information technology company**
- **Operational Reliability Analysis Program (ORAP)**
  - Over 20 years experience in reliability tracking and benchmarking
  - Gas and steam combustion turbine operations
- **ORAP for Wind**
  - Capture RAM data at component level
  - Close relationship with OEMs and operators
  - Customer-specific data treated as proprietary
  - Minimize human input
  - Internet-enabled reporting and feedback
- **Industry-driven methodology**
  - IEEE, IEC and ISO standards
  - NERC compliant



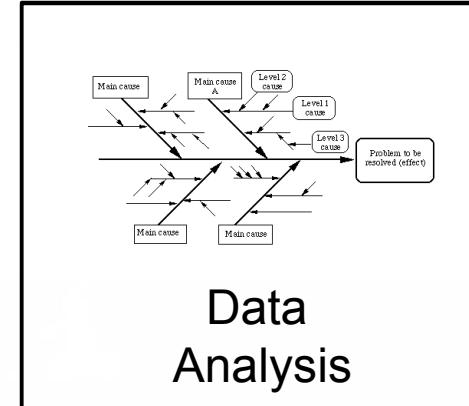
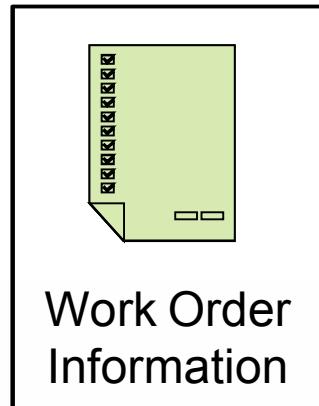
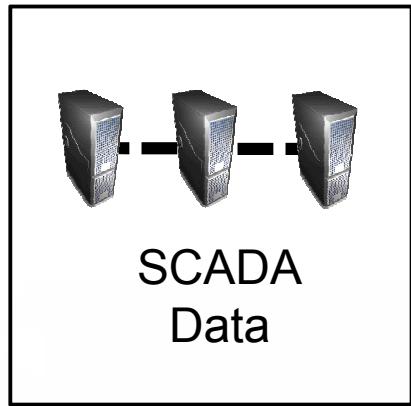
# CREW Database Growth



1 plant, 1 year = 138 Gigabytes of CREW data



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## NOW: Owner/Operator

- Reduced Downtime
- Effective Maintenance
- Improved Performance
- Better \$ Decisions
- Lower Costs

## LONG-TERM: US Fleet

Improved Quality of Next-Generation System and Components

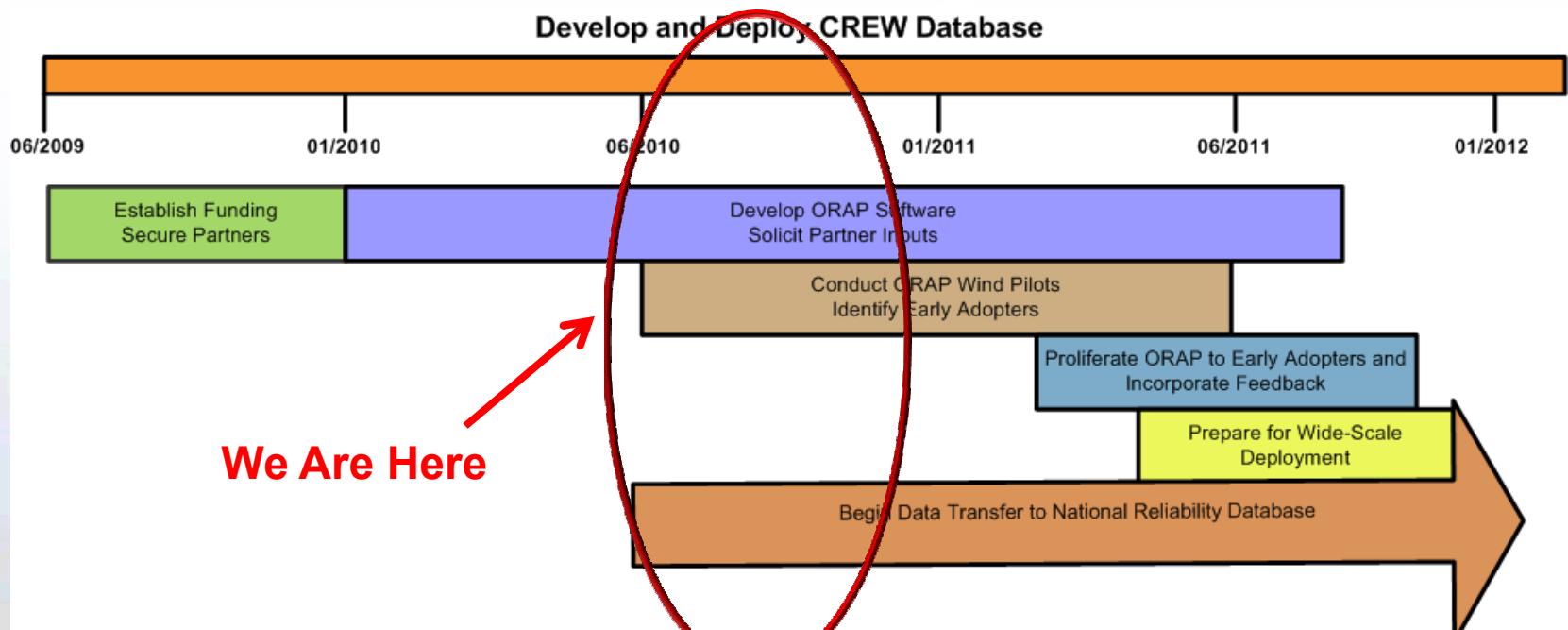


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# Development Phase

## ■ Critical Roles:

- Sandia National Labs: manage project and develop CREW database
- Strategic Power Systems (SPS): develop a wind plant version of ORAP
- Pilot Partners: demonstrate high-volume data flow
- Advisory Board: provide input and influence industry adoption
- Early Adopters: demonstrate scalability of ORAP



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