
DOE Sensors & Automation 2007 Annual Portfolio Review

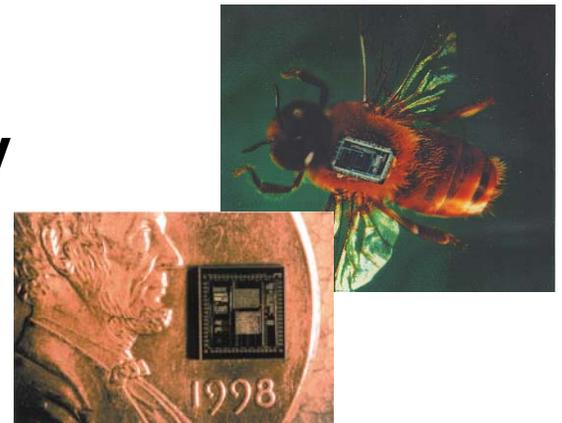
INDUSTRIAL WIRELESS IS HERE:

Moving Forward: DOE's Wireless Program
Tackles the Hard Problems

Wayne W. Manges

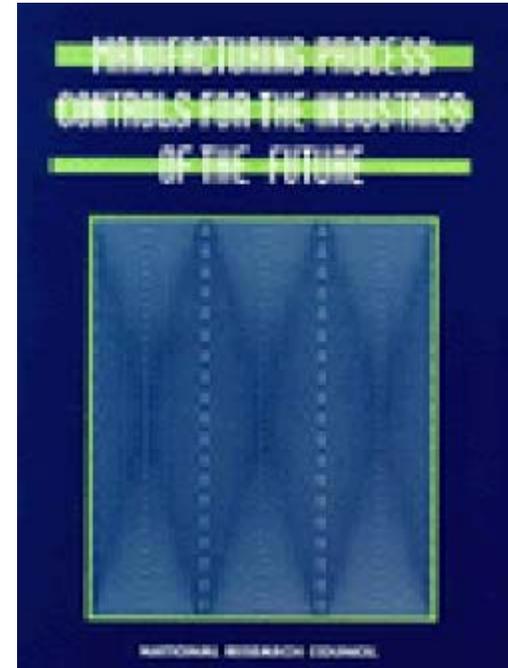
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National Research Council (NAS) Identified Wireless Research Needs

- Interference Rejection – self-interference from metal surfaces, lots of sparks and other sources
- Integrated Intelligence – reduces need for host communication
- Reliable Networks – ad hoc routing, security
- Power – harvesting and new batteries
- Standards – communication, interfaces, and protocols



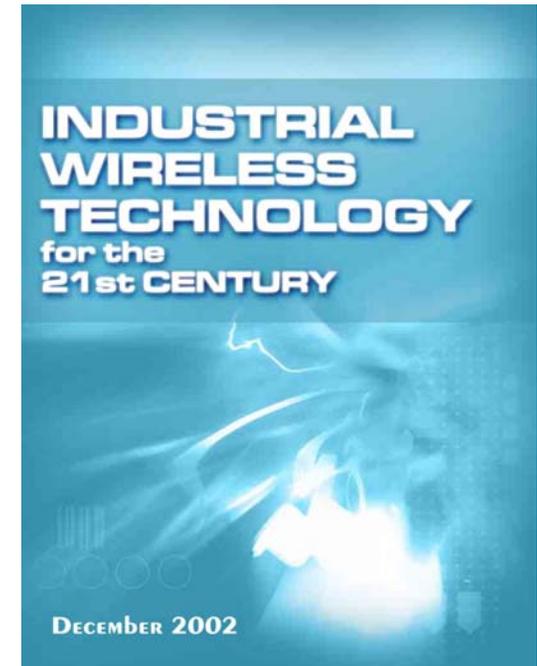
Manufacturing Process Controls for the Industries of the Future (1998) - Free PDF version at NAS

Presidential Advisory Committee report identifies industrial wireless with potential for 10% improvement in production efficiency and 15% emission reduction. Honeywell study confirms. Could save ~ 100 coal-fired plants!

Vision: Industrial Wireless Moving Forward

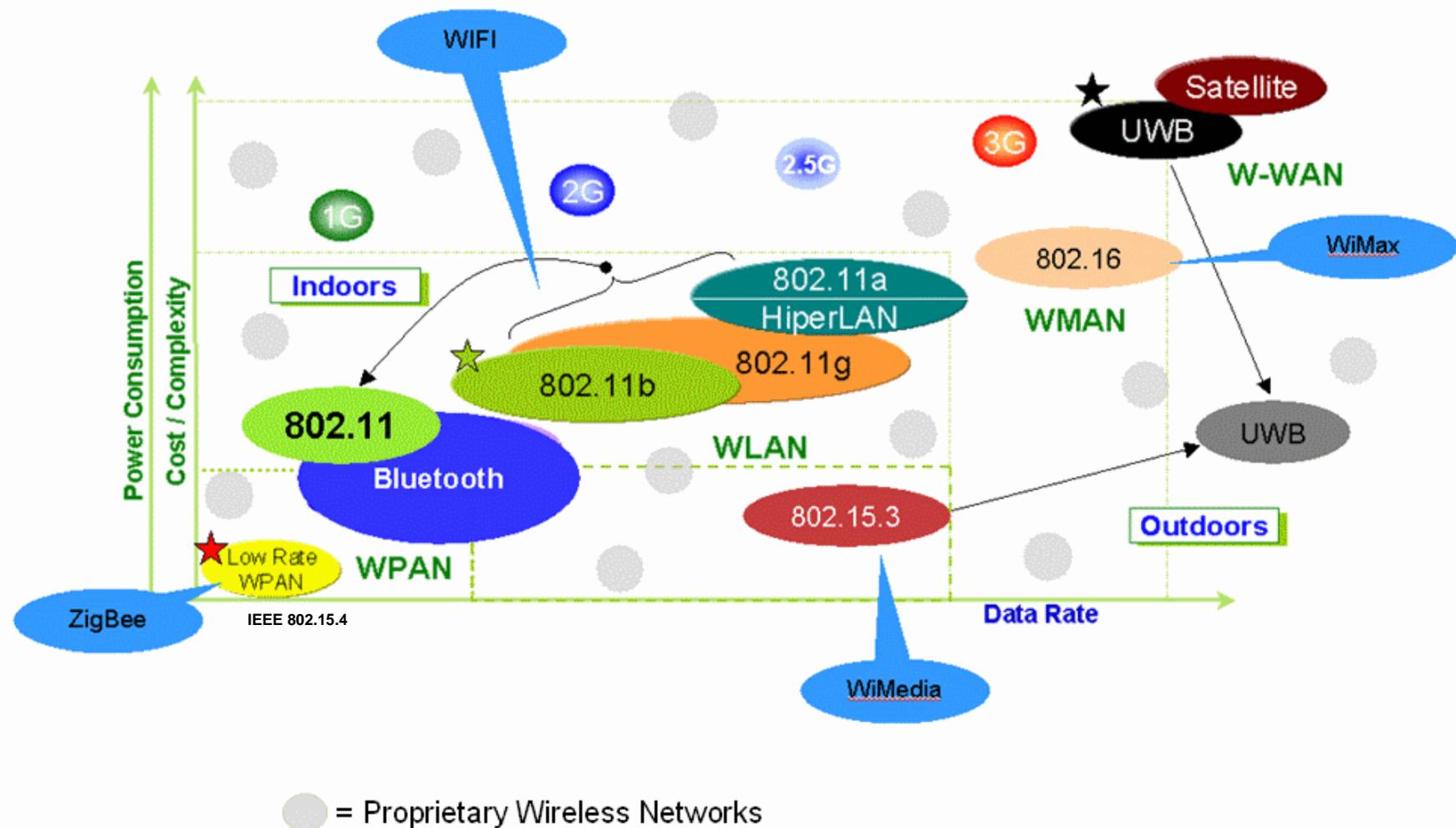
Industrial wireless technology will be

- robust,
- reliable
- cost-efficient
- totally secure
- often integral to the measurement device
- the *obvious choice* for monitoring and controlling industrial processes to optimize resource efficiency and productivity.



Get pdf at WINA web site

The Wireless Landscape – Can You Hear Me Now?



Wireless Industrial Sensor Networks – Pick Any Four!

- **Wireless – radio, packaging, antenna**
- **Industrial – harsh environment, fault tolerant, safety related, cost**
- **Sensor – filters, sampling, sensitivity, interferers, controls**
- **Networks – real-time, latency, throughput, security, integrity, vertical integration**



Metrics Critical To Balancing Performance

Reliability

(Not BER,
Not Accuracy)

Latency

End-to-end? Or
Node-to-node? One-way?
Round-trip?



*Market
Forces
Determine
Performance
Delivered!*



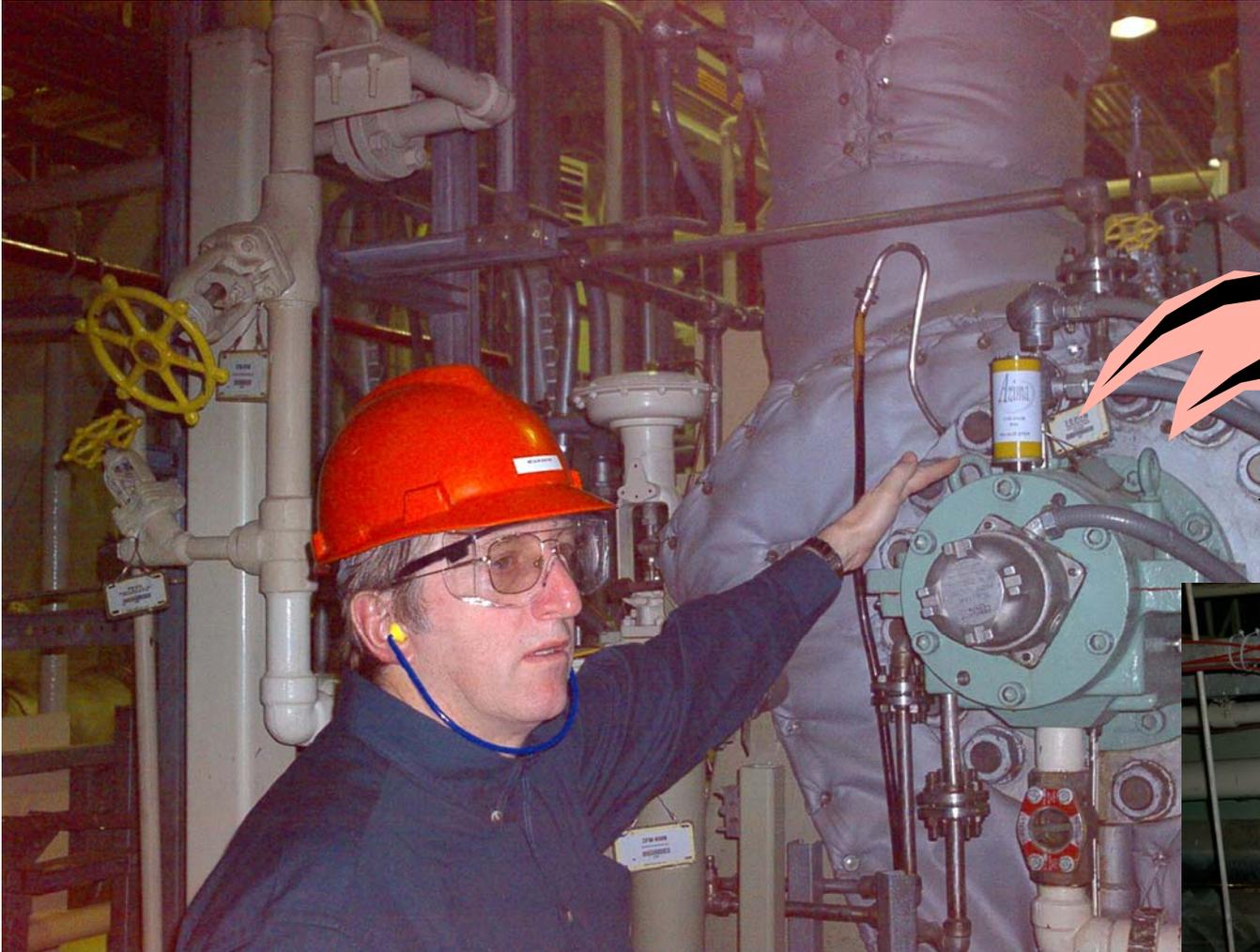
Throughput

Bits-per-second or Goodput?
End-to-end?

Security

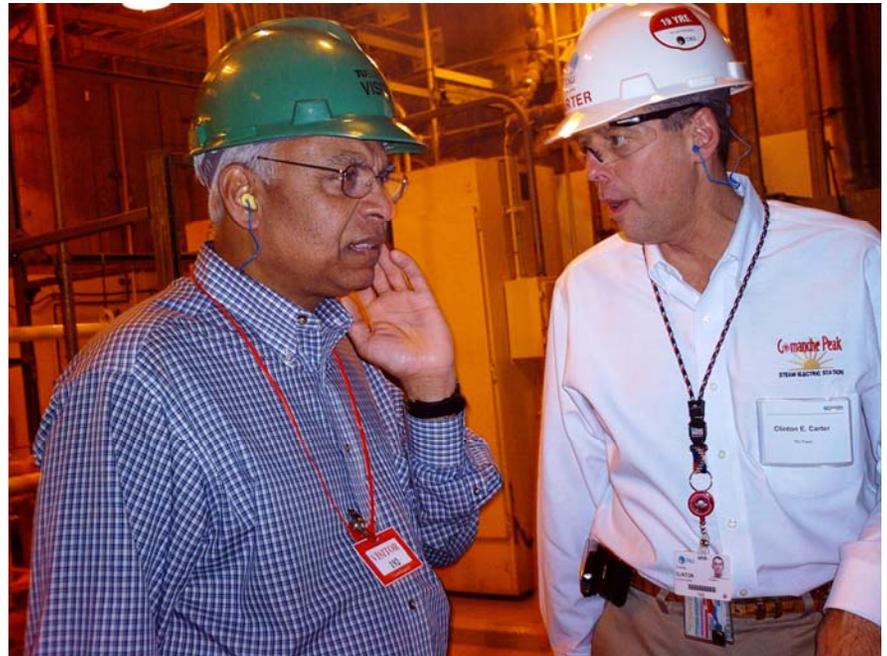
Performance Based?
Procedure Based?
Proprietary or Open?

Early Adopters Having An Impact



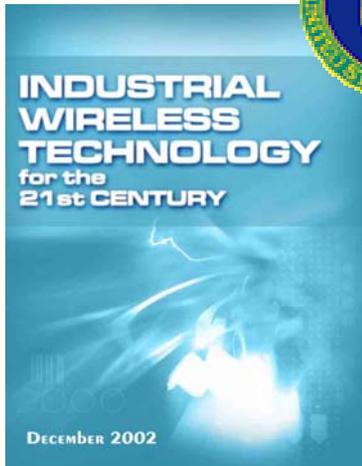
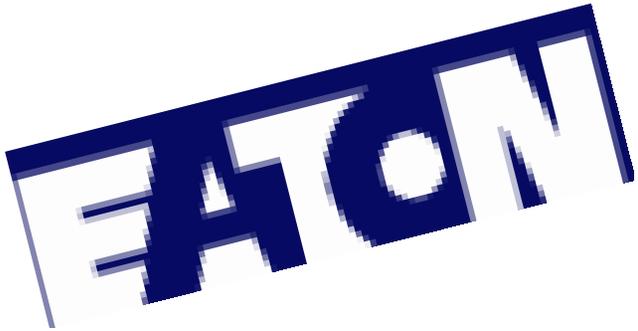
Is Current Wireless Technology Suitable?

- **Everywhere – unlikely**
- **Somewhere – almost certainly**
- **Key – sound engineering – match the application, environment, cost to the options**
- **SP100 – ISA Wireless Industrial Automation Standard – check it out!**



Proven in nuclear power plant?

The Big Guns Have Come to the Table!



imagination at work

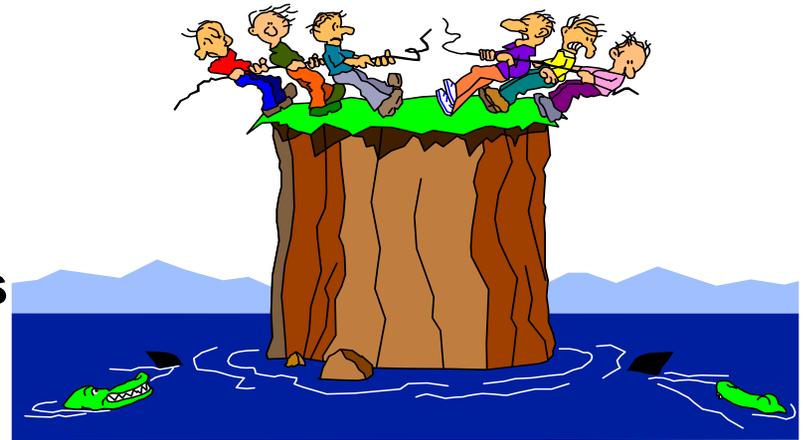
Honeywell

- **Shared Vision – Ubiquitous Deployment**
- **Teamwork – High Tech components from critical small-business partners**
- **Impact - beyond asset visibility, beyond supply chain visibility to process visibility**



Who Will Lead, Who Will Follow, Who Will Whine?

- Technology is ready - driven by cellular personal/business communications
- Market is ready - \$2000/ft for wires in some plants
- Are we ready? - partnerships, consortia, standards and collaborations
- Next Step? – Find the right place to start!



Standards
Certification
Education & Training
Publishing
Conferences & Exhibits

ISA SP100:
Wireless Systems for Automation
*Reliable Wireless for Monitoring and
Control Applications*