

*Looking Moving
into the Future*

*...from reactive
diagnosis*

*...to proactive
predictive
prognosis*

**Prognostics
and
Health Management
Center of Excellence**

**A Distributed Center
for
Technology
Development and
Transition**

*...to proactive
health
management*

through a

*Center of
Excellence*

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December 6 – 8, 2004

PHM COE Phase I Advisory Board Meeting



Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.



Sandia National Laboratories



Thank You

Organizational and Society Sponsorship

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- Dennis Hecht & Howard Savage (NDIA Integrated Diagnostics (ID) Co-Chairs) and Jim Dill (NDIA Electronics Prognostics (E-PHM) Task Group Lead) and the entire NDIA ID Committee & Members and the E-PHM Task Group Members
- Raj Rao and the entire COMADEM International Congress, UK MOD, & Royal Netherlands Navy

Sandia

- Kathy Cash – administrative support
- Gaye Garrison – web-site development
- Ray Shaum – business administration
- Bob Thomas - Advanced Simulation Computing (ASC) Program Manager
- All who are here this week or on call to assist, as well as those who have worked behind the scenes over the past 8 months in getting us today

And you - our Government, Industry, and Academic Participants



PHM COE Goals

PHM Center of Excellence goals are to advance PHM state-of-the-art through IEEE standards (or other relevant standardized metrics), a centralized information systems infrastructure, technology analysis and development, and technology test and validation. Technology transfer will be achieved through cooperative R&D and IP licensing to industry and academia.

Information Systems Development Capabilities will include

- An infrastructure to collect and store sensor data
- A warehouse for integration with related data such as materials, maintenance, aging or other test data
- Tools to view, analyze and make predictions

Technology analysis and development will include

- Sensor development and validation
- Algorithm development and validation
- Fault data source for diagnostics and prognostics technique development
- Alpha & beta test facility for sensors, algorithms, diagnostics & prognostics techniques
- Integrated training for field practitioners and technicians using data and algorithms

Technology test and validation facility will include

- Machinery system test facility
- Fluid diagnostics test facility – oil debris and hydraulic fluid particle analysis
- Structural diagnostics system test facility
- Electrical and electronic systems

Achieving the Meeting Goals is the First Step to reaching the PHM COE Goals

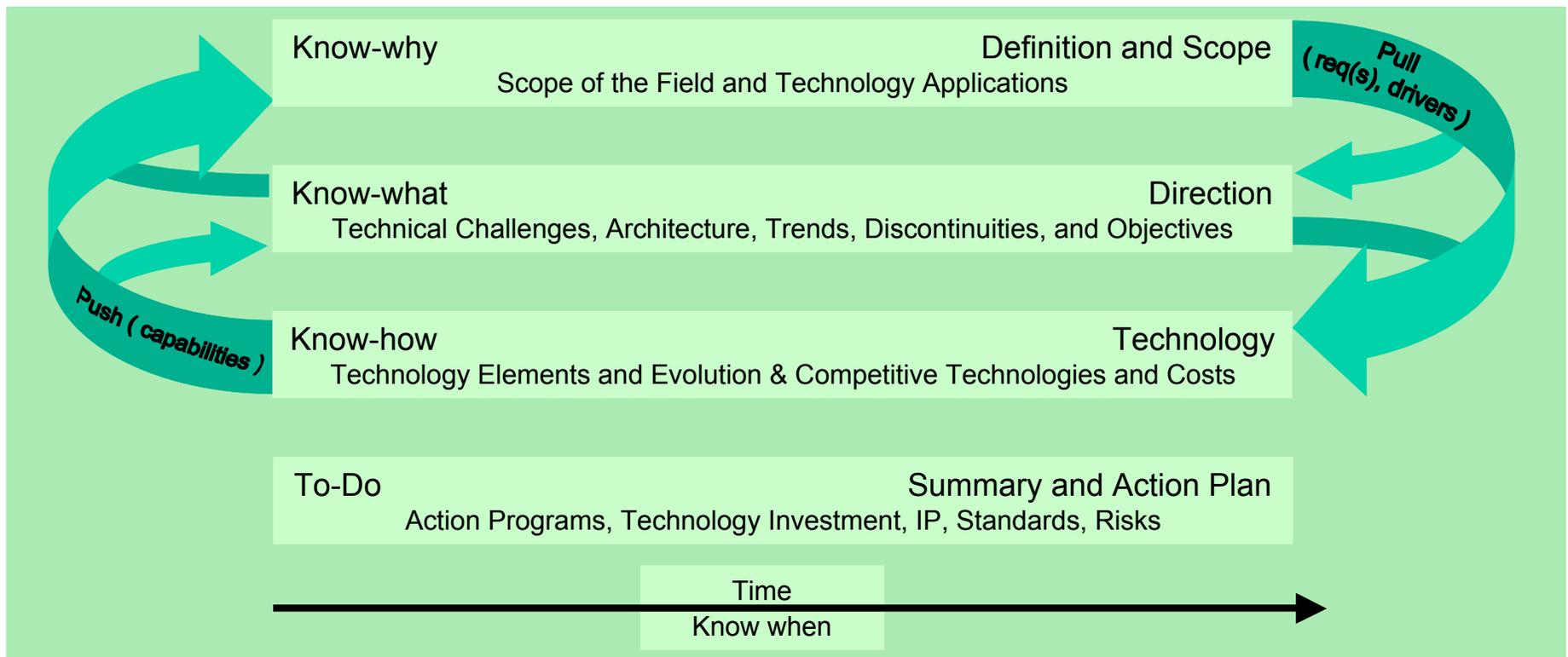


Purpose of the Meeting

The purpose of this meeting is to jointly develop a path forward in realizing the PHM COE.

This will be achieved through the development of a high-level Science and Technology Roadmap.

- We will be using Sandia's Technology Roadmapping Process
 - www.sandia.gov/PHMCOE/roadmap.htm, "Fundamentals of Technology Roadmapping" (pdf)
 - Copies of the document are also available for this meeting
- We will cover four major topics, linking them together with key drivers, and a sense of time





Technology Roadmapping Process

Phase I: Preliminary Activity

1. Satisfy essential conditions
 - a. Perceived need for the roadmap and collaborative development
 - b. Diversity in the roadmapping effort needs input and participation
 - c. Participation from various organizational components (e.g., mkt, manuf, R&D, planning, etc) and customers & suppliers
 - d. Focus on areas of common need - conflicting conditions must be avoided
 - e. Process must be Customer-needs-driven and not solution-driven
2. Provide Leadership/sponsorship
3. Define the scope and boundaries for the technology roadmap

Phase II: Development of the Technology Roadmap

1. Identify the output that will be the focus of the roadmap
2. Identify the critical system requirements and their targets
3. Specify the major technology areas
4. Specify the technology/cost drivers and their targets
5. Identify technology alternatives and their time lines
6. Recommend the technology alternatives that should be pursued
7. Create the technology Roadmap report (All - Wednesday Morning)

Phase III: Follow-up Activity

1. Critique and validate the roadmap
2. Develop an implementation plan
3. Review and update



Meeting Goals

Activities/Roles of the Prognostics and Health Management Center of Excellence				
		Near-Term (1-3 Years)	Mid-Term (4 – 8 Years)	Long-Term (8 – 15 Years)
Research and Development (Technical Issues)				
Information Systems Development	Academia Role			
Technology Analysis & Development				
Technology Test & Validation Facilities				
Information Systems Development	Industry Role			
Technology Analysis & Development				
Technology Test & Validation Facilities				
Information Systems Development	Government Role			
Technology Analysis & Development				
Technology Test & Validation Facilities				
Market Opportunities (Market Issues)				
	Academia Role			
	Industry Role			
	Government Role			
Policy and Institutional Initiatives (Institutional Issues)				
	Academia Role			
	Industry Role			
	Government Role			



Meeting Goals (continued)

Commitment to support Sandia's proposals to potential funding sources (e.g., DARPA, NRO, DOE)

Commitment to support further development (e.g., requirements, refinements, issues) of the High-Level PHM COE Science and Technology Roadmap (developed this week) between now and Feb 1, 2005

Commitment to return to Sandia by Feb 1, 2005 with decisions on contracts / SOWs which will be drafted as part of this meeting

Commitment to support the Phase II Advisory Board Meeting (dependent on the former)

- Phase III PHM COE Science and Technology Roadmap Process (somewhat dependent on the former)
- February / March timeframe

Note: Information assimilated during this meeting will be available on the PHM COE web-site before Dec 15.