MPAR Unified R&D Plan

WG-MPAR Meeting 2010-2

Jud Stailey, Executive Secretary

MPAR Unified R&D Plan

Background

- Original R&D Plan was in OFCM, 2006*:
  - Description in Section 6
  - Details in Appendix D
- Action from MPAR Symposium II to update plan
  - Identify technical challenges; develop unified R&D plan

*OFCM 2006: Federal Research and Development Needs and Priorities for Phased Array Radar, FCM-R25-2006

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Background

- Action Item 2009-1.3 from MPAR EC meeting 2009-1 in response to Symposium action
  - Identify technical challenges to MPAR and update the existing R&D plan to address those challenges in a unified R&D Plan. Include an assessment of risk associated with each element of the Plan.

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Approach

- Rewrite and adapt Section 6 material
- Reorganize details around major components and research elements
  - Indicate where the research is likely to be conducted (i.e., as part of what research initiative)
  - Base time-frame on timing of research initiative
  - Add risk factors
- Primary contributors: NSSL, FAA William J. Hughes Technical Center, GTRI, OFCM

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Determining Risk Factors

- Identified two types of risk and contributors to those risks (see Section 6 of Plan)
  - Technical Risk
    - Fabrication
    - Performance
  - Programmatic Risk
    - Funding
    - Contract

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Determining Risk Factors

Quantification of Risk Contributors

- Technical Risk
  - Fabrication:
    - The unit (or something very similar) has been built before or well-understood techniques and materials will be used [score=0.5]
    - Fabricating the unit involves application of advanced technology, but there is reasonable confidence in the processes [score-1.5]
    - Fabrication of this type has never been done before and presents significant challenges [score=2.5]

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Determining Risk Factors

Quantification of Risk Contributors (Con'd)

- Technical Risk
  - Performance:
    - Past experience suggests high confidence in positive results; success is likely [score=0.5]
    - Objectives present some challenges, but there is reasonable confidence that challenges can be overcome; success is achievable, but not guaranteed [score=1.5]
    - Challenges will be difficult to overcome; success would require significant advances in current knowledge and/or technology [score=2.5]

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Determining Risk Factors

Quantification of Risk Contributors (Con'd)

- Programmatic Risk
  - Funding:
    - Funds are in the budget and secure [score=0.5]
    - Funds are in the budget, but at risk [score=1.5]
    - There is no funding identified for this work [score=2.5]

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Determining Risk Factors

Quantification of Risk Contributors (Con'd)

- Programmatic Risk
  - Contract
    - A contract vehicle for this work is available, or work doesn't require a contract [score=0.5]
    - Work is underway to put a contract vehicle in place for this work [score=1.5]
    - There is no contract vehicle available or planned for this work [score=2.5]

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Determining Risk Factors

- Technical Risk

  Fabrication Risk + Performance Risk

- Programmatic Risk

  Funding Risk + Contract Risk

- Risk Factor:

  1 = minimal

  2 = low

  3 = moderate

  4 = high

  5 = extreme

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Sample Section of Plan

Component	*Research Element*	*Timeframe*	*Research Initiative*	*Risk Factor*	
				Technical	*Program - matic*
Technology Development and Testing	Dual Polarization				
	• Cross-polar isolation	2010-2012	FreEnt Panel (NSSL SBIR for innovative approach)	4	1
			Oklahoma University Array (cylindrical)	3	2
			MIT-LL Panel	4	1
			Purdue University Panel	3	1
		2011-2013	Technical Assessment Program	4	3
	• Implementation (simultaneous/ sequential)	2011-2013	Technical Assessment Program	2	3
	• Application in X- and C-band	2010-2016	NSSL	4	2
		2010-2016	CASA	4	1

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Further Work

- Immediate needs:
  - Cost estimates
  - Priorities
- Identify additional relevant PAR R&D to leverage
- Review at least annually for
  - New R&D needs
  - New R&D initiatives
  - Updates to schedule or costs
  - Completed work

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Cost Issues

- Cost can be estimated at the initiative level in a separate spreadsheet
  - Too many research elements to divide costs amongst
  - Annual budget would be the same regardless
  - Break out already funded initiatives

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R&D Initiatives

- Technical Assessment Program
- NWRT Upgrade
- MPAR Prototype
- Small Panels:
  - MIT-LL
  - FreEnt
  - Purdue
  - OU Array
- CASA
- NSSL Research Initiatives
- NCAR
- DHS Studies

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Priority Issues

- Priorities should be assigned at the element level
  - Priority scale (1-3, 1-5, 1-10?)
  - First cut related to three primary objectives
    - Dual Pol highest
    - Cost Second
    - Multifunctionality Third
  - Build into plan matrix