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Author(s): Dianne Wilburn

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Roadmapping for Development of Future Investments in Environmental Science and Technology

Dianne Wilburn
Los Alamos National Laboratory
P. O. Box 1663 MS J591
Los Alamos, NM 87545-1663
dwwilburn@lanl.gov

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INTRODUCTION

This paper will summarize efforts in roadmapping SCFA technical targets, which could be used for selection of future projects. The timely lessons learned and insights will be valuable to other programs desiring to roadmap large amounts of workscope, but unsure how to successfully complete it, by adequately defining a strategy to develop alternatives and core technologies to ensure needed environmental technologies are available and allow delivery of viable alternatives.

In early FY02, Los Alamos National Laboratory's Environmental Science and Waste Technology Program Office was working jointly with Idaho National Environmental Engineering Laboratory to define and develop science and technology mini-roadmaps. We were defining and developing these mini-roadmaps to provide direction and guidance for DOE's Environmental Management's (DOE-EM) Subsurface Contaminants Focus Area (SCFA) in their development of target technologies. DOE EM's Strategic Plan for Science and Technology[1] provides guidance for meeting science and technology needs with a view of the desired future and the long-term strategy to attain it. Program and technology mini-roadmapping were to be used to establish priorities, set program and project direction, and identify the high-priority science and technology need areas according to this document. In the past, EM science and technology needs collection is achieved through the DOE Site Technology Coordination Groups (STCG) across the complex. A future system for needs collection has not been defined.

However, there is a need for gap analyses and a technical approach for the prioritization of these needs for DOE-EM to be strategic and successful in their technology research, development, demonstration, and deployments. To define

the R&D projects needed to solve particular problems and select the project with the largest potential payoff will require analysis for project selection. Mini-roadmaps could be used for setting goals and priorities for future program planning and development of future investments in environmental science and technology, which would reduce risk by delivering additional data and technologies with possible incremental improvement to baselines.

WORK DESCRIPTION

Over the past several years, SCFA has successfully developed and deployed technology to enhance DOE's environmental management and stewardship activities. SCFA held a brainstorming meeting to determine the best approach to build on past success and to improve future success. In this "2001 Beyond Breakthrough Meeting," SCFA devised the concept of "Technical Targets" as an important tool to help prioritize and select work and to improve investment efficacy and returns in the future. Technical Targets capture and prioritize DOE-EM subsurface contamination science and technology needs based on technical considerations and experiences elicited from a highly qualified broadly representative team.

An Initial Technical Target Development Workshop was held in Golden, Colorado, in June 2001. This was an intense focused effort with 22 technical participants. The meeting addressed the Technical Target concept and included the development of a list of Technical Targets based on DOE needs. The entire group initially discussed each target. In this initial discussion, participants were encouraged to rapidly describe their most creative ideas for technical issues/themes related to the topic. The group's initial ideas were then used by a small team of approximately three participants to generate a detailed outline for the proposed target content. The outline was the basis for a second discussion by the

entire group to determine if there was general consensus on the approach being described. The Second Technical Targets workshop was conducted in November 2001. The outcome of this workshop was refinement of the Technical Targets and a decision on a path forward for 4 technical targets to mini-roadmap in FY02. The technical targets were evaluated for complexity and potential benefits to prioritize the order for mini-roadmap preparation.

Prior to the reorganization of DOE-EM, SCFA was developing "mini roadmaps" for each technical target to outline specific performance requirements, where improvements are needed, when the improvements are needed, and the significance to the DOE programs. Four technical targets were identified as the first candidates for roadmapping and were to be completed in FY02. The technical community within SCFA was to develop the potential targeted improvements and the end-users would help describe the potential impact of these improvements to their programs. The end product from these "mini roadmaps" was to include the target's technical objectives with a definition of the performance objectives and potential impacts, step improvements to current high cost/high risk baselines, identify technology areas where the greatest benefits could be realized by an aggressive investment strategy and include a complete analysis of the requirements for alternatives, the drivers for the requirements and the efficacy of the approach for the long term.

RESULTS

The roadmapping process chosen is a scaled down version of the typical roadmap discussed in DOE's draft guidance document[2]. The scaled down version is referred to as a "mini-roadmap" and differs from a typical roadmap in that it is only developed partially through the technical response phase III of the draft guidance.

This means the product can be used for strategic decisions, but will not contain a detailed development path. It will contain the problem description, the sites that have it, what performance improvements are needed, when they're needed, what technical advances are needed, and what types of research and development could be used to deliver the technology.

CONCLUSION AND DISCUSSION

The current DOE site technical needs collection method[3] yielded over 300 needs in fiscal year (FY) 2001 and requires a means to help focus development. Whereas a new needs collection system has not yet been determined, there is still the need to determine problems in need of a solution. With a desire to improve project selection, specific strategic objectives needed to perform specific development could be accomplished with mini-roadmaps.

The mini-roadmapping process could further mature the selection of projects from the current state of generally defined research objectives to a level that can begin to be useful in strategic planning within DOE-EM. Lessons learned would then be folded into the mini-roadmap process to provide technically viable alternatives that could have major impacts and reduce baseline risks. Additionally, further definition of the technology development plans may be desirable if the complexity is too great or the confidence of delivery is too low.

REFERENCES

1) *Environmental Management Strategic Plan for Science and Technology*, U.S. Department of Energy, November 1998. http://www.em.doe.gov/ftplink/scitech/straplan.pdf

2) *Applying Science and Technology Roadmapping in Environmental Management (Draft B)*, U.S. Department of Energy, Office of Environmental Management, Under DOE Idaho Operations Office Contract DE-AC07-99ID13727. http://emi-web.inel.gov/roadmap/guide.pdf

3) U. S. Department of Energy Technology Management System. http://TMS.em.doe.gov/Home/Entry.asp?Show=Sites

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