Sandia National Laboratories
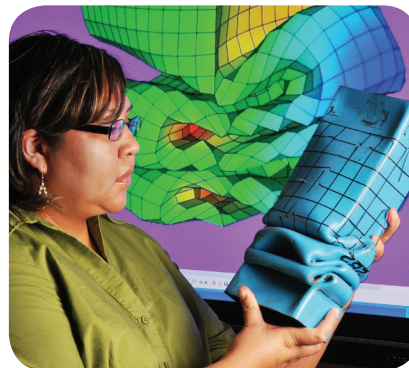
RESEARCH QUALITY STANDARDS

Enhancing our research leadership

INTENT

The intent of our quality standards are to:

1. Enhance our leadership in research and innovation while concurrently preventing the undesired consequences of research defects.

2. Help research scientists avoid common problems that could adversely affect their reputation and career.

Our standards focus on providing individuals the guidance needed for success in a professional research environment, building on their academic training in the scientific method.

VISION

Our customers, colleagues, and stakeholders trust that our research is of the highest integrity. We perform research that is relevant, high value, and high fidelity. We realize the fullest value of our research through all aspects of dissemination and stewardship of the knowledge.

INTEGRITY

We conduct our research in a manner that is honest, fair, responsible, and ethical.

RELEVANCE

We address current and long term challenges consistent with Sandia's mission.

HIGH VALUE

The significance of our research is clear and compelling.

FIDELITY

Our research is thorough, sound, reproducible, and can be used with confidence.

DISSEMINATION

We communicate our work and results in ways that can be understood, appreciated, and built upon.

STEWARDSHIP

We manage and preserve the knowledge, methods, capabilities, and products of our work to be faithfully transferred to others in the future.

STRATEGY

Our quality strategy seeks to prevent problems at every phase of our research and catch issues as early as possible.

This approach is used because it is well established as the most effective way to maintain high quality.

Our strategy relies on a culture that is open to collaboration, critique, and a personal commitment to identifying issues that others have missed.

The basis for our standards, captured in our *Research Quality Standards Document*, come from three documents which discuss commonly recognized research quality issues identified by the National Academy of Sciences, the National Academy of Engineering, the Institute of Medicine, the U.S. Department of Energy (DOE), and the American Society for Quality (ASQ):

1. *On Being A Scientist, A Guide To Responsible Conduct In Research*, 3rd edition, The National Academies Press, 2009.

   http://www.nap.edu/catalog.php?record_id=12192
   Click DOWNLOAD FREE PDF, create account, download book.

2. DOE O 414.1D, *Quality Assurance Criteria*, Attachment 2, pages 1-2.

   http://info.sandia.gov/primecontract/App%20G%20Directives/DOE%20O%20414.1d.pdf
   Scroll down to pages 19 & 20.

3. ANSI/ASQ Z1.13-1999, *Quality Guidelines for Research* (referenced in DOE O 414.1D)

   http://infoserve.sandia.gov/ihs/index.htm
   Click IHS STANDARDS EXPERT, type ASQ Z1.13 into Document Number search box, then click View icon next to ASQ Z1.13

Additional Information:

1. Research Quality Standards Document:
   https://cto.sandia.gov/prodevel.html

2. Defect Prevention Best Practices for Research website:
   http://mstc.sandia.gov/1730/def-prev-best-prac-research.shtml

3. *A PhD Is Not Enough! A Guide to Survival in Science*, Peter J. Feibelman, Basic Books, 2011

   Available through SNL Technical Library. Click ELECTRONIC LINK, create account to read online

THE PHASES OF RESEARCH*

Planning And Initiating The Research

Includes identifying a knowledge or technology gap that needs to be filled, defining who the customer and stakeholders are for the research, creating an accurate picture of how the value and benefits of the proposed research compare to its threats and costs, clarifying customer expectations for deliverables, planning for transfer to product development, and securing funding.

Performing The Research

Executing the research with high confidence that the scientific method was followed and in such a way as to ensure repeatable results by other researchers in the future.

Evaluating The Research

Implementing effective peer reviews using both internal and external experts to validate the value of the research, ensure proper methods and approaches were used, and to verify results.

Communicating The Results

Ensuring that results are effectively communicated to customers and stakeholders in such a way that customer stress is minimized and their confidence in us maximized.

Transferring The Results

Taking actions to ensure that transfer of the knowledge or technology to the next phase (usually development or use in an application) is successful.

Delivering Prototypes

Ensuring that the deliverables provided to the customer are capable of achieving the business results they expect.

* Modified from ANSI/ASQ Z1.13-1999, *Quality Guidelines for Research*