Department of Energy
Washington, DC 20585

June 17, 2013

MEMORANDUM FOR INGRID KOLB
DIRECTOR
OFFICE OF MANAGEMENT

THROUGH: KEVIN T. HAGERTY
DIRECTOR
OFFICE OF INFORMATION RESOURCES

FROM: GLENN S. PODONSKY
CHIEF HEALTH, SAFETY AND SECURITY OFFICER
OFFICE OF HEALTH, SAFETY AND SECURITY

SUBJECT: Notice of Intent to Revise Department of Energy Guide 414.1-4, *Safety Software Guide for Use with 10 CFR 830, Subpart A, Quality Assurance Requirements, and DOE Order 414.1C, Quality Assurance*

PURPOSE: This memorandum provides justification for revising Department of Energy (DOE) Guide (G) 414.1-4, *Safety Software Guide for Use with 10 CFR 830, Subpart A, Quality Assurance Requirements, and DOE O 414.1C, Quality Assurance.* This Guide currently provides information and acceptable methods for implementing the safety software quality assurance (SSQA) requirements of DOE Order (O) 414.1C, *Quality Assurance.*

JUSTIFICATION:

Background: DOE G 414.1-4 was originally issued with DOE O 414.1C in June 2005 and its re-certification for continued use was approved by the Directives Review Board on November 3, 2010. On April 25, 2011, the Department published a revision to the quality assurance (QA) Order, DOE O 414.1D. Among other items, this revision clarified requirements for safety software, including required documentation, approvals, and the QA elements necessary for a SSQA program. The revision to DOE G 414.1-4 will conform to the revised Order and incorporate new information and lessons learned since 2005, including information gained as a result of the February 2011, Government Accountability Office (GAO) report, GAO-11-143 *NUCLEAR WASTE: DOE Needs a Comprehensive Strategy and Guidance on Computer Models that Support Environmental Cleanup Decisions.* A review of existing external consensus standards was conducted and none were identified that can be used in place of this Directive.

Summary of Development Process: The proposed revision to the Guide will be developed by a writing team of subject matter experts drawn from the Federal and

Printed with soy ink on recycled paper

contractor staff including affected line programs and field offices. The Guide will be revised and organized to reflect the above and provide better clarity and implementing guidance.

Applicability: This Guide applies to DOE, including the National Nuclear Security Administration (NNSA), and its contractors. Various DOE elements, including NNSA, were involved in the development of DOE O 414.1D. This Guide supports DOE O 414.1D by providing acceptable guidance (not requirements) to implement the Order.

Major Changes: The major changes to DOE G 414.1-4 will reflect the changes made to DOE O 414.1D, which include use of specific versions of American Society of Mechanical Engineers (ASME) Standard NQA-1-2008, *Quality Assurance Requirements for Nuclear Facility Applications,* and requirements for software other than safety software. Additionally, computer modeling validation and experience gained using Appendix B of the Guide (including streamlining to remove redundant and outdated material) will be addressed in the revised Guide. The following specific changes are planned:

- Update guidance related to various SSQA work activities, safety software inventory management and the application of grading levels;
- Update Appendix C, *Use of ASME-NQA-1-2000 and Supporting Standards for Compliance with DOE 10 CFR 830 Subpart A and DOE O 414.1C and Safety Software* of the Guide, which currently provides a crosswalk to the requirements contained in ASME NQA-1-2000, *Quality Assurance Requirements for Nuclear Facility Applications;*
- Review scope to include software used in nuclear and non-nuclear facilities that is not defined as safety software, but is important for personnel safety or mission operations. The QA requirements of such software per the QA Order will be reviewed and the feasibility of providing appropriate guidance in the revised Guide will be explored;
- Revise Appendix B, *Procedure for Adding or Revising Software to or Deleting Software from the DOE Safety Software Central Registry,* of the Guide based on experience gained from applying the Appendix to evaluate three new codes (e.g., HotSpot version (V)2.07.01, GENII V2.10, and ALOHA V5.4.2) for inclusion as Toolbox codes in the Safety Software Central Registry;
- Incorporate general guidance on computer model validation; and
- Review, modify, and incorporate into Appendix B, four draft templates which were developed to assist with recently completed Toolbox code evaluations. The templates are the Software Quality Assurance Plan, Software Configuration Management, Verification & Validation Test Plan, and Software Requirements Matrix.

Directive Development Schedule: See the proposed development schedule below. The proposed changes are significant and will require considerable time and effort to review pertinent information and develop the draft. The time indicated is necessary to
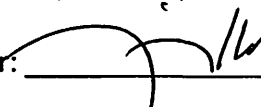
complete this revision and accommodate suggested changes from a number of DOE-wide reviewers and to address the expanded scope of guidance for: model validation, software not designated as safety software, GAO Report recommendations, and Defense Nuclear Facilities Safety Board interest, as well as to review applicability to DOE SQA approaches used by the Environmental Protection Agency, the National Aeronautics and Space Administration, and the Department of Defense, as well as those specified in the applicable industry consensus standards, and as discussed in other publications. Because of the considerable interest in SQA, significant comments are expected and time will be needed to reach consensus with the various stakeholders. Peer review and comment resolution will be conducted to the extent possible before the formal RevCom review to improve the quality of the Guide as well as to reduce the number and substance of the RevCom comments. It will be difficult to get the necessary resource commitments from potential participants for the development and peer-review efforts until this justification memorandum is approved.

IMPACT: The proposed revision to DOE G 414.1-4 will provide acceptable methods for implementing DOE O 414.1D and will not place any new requirements on DOE or its contractors. The revision to the Guide will be consistent with DOE O 414.1D. The proposed revision does not duplicate existing laws, regulations, or national standards; and does not create undue burden on the Department.

WRITER: Subir Sen (301) 903-6571

OPI/OPI CONTACT: Colette Broussard (301) 903-5452

Ingrid Kolb, Director, Office of Management (MA-1):

Concur: _____ Non-concur: _____ Date: 7-17-13

Unless determined otherwise by the Directives Review Board (DRB), writers will have up to 60 days in which to develop their first draft and submit to the Office of Information Resources, MA-90.

Schedule for Directives Development	Standard (Days)	Proposed (Days)
Draft Development	Up to 60 days	330 *
Review and Comment (RevCom)	30	~~45~~ 60
Comment Resolution	30	45
Final Review	30	30
Total	150	450

*Extended duration for draft development is necessary in part to include activities such as; establishing the writing team, revising the scope, initial review of relevant publications, industry standards, and other agency documentation and to finalize the framework for the draft Guide.

3