SAND2012-2382C

A New Look at Continuity of Knowledge: Safeguarding the 21st Century Nuclear Fuel Cycle

Dianna Blair and George Baldwin
Sandia National Laboratories[1]

Chris A. Pickett
Oak Ridge National Laboratory[2]

Robert Bean
National Nuclear Security Agency
Office of Nonproliferation and Verification Research and Development

Raymond Lawson
Savannah River National Laboratory

Keith Tolk
Milagro Consulting

This century will see an expansion of the nuclear fuel cycle to accommodate both demand and interest. Becoming more global, the challenges presented to the International Atomic Energy Agency (IAEA) of this increased geographic dimension, as well as the expectations imposed by more countries implementing the Additional Protocol, will tax both its resources and capabilities. This new reality will require the IAEA to identify improvements to the measures it deploys. A systems view of the State Level Approach (SLA) should identify opportunities for cost saving measures while not compromising effectiveness. One area that could significantly contribute to this new effectiveness model is Continuity of Knowledge (CoK). Long used by the IAEA as one of its fundamental measures, the 21st century safeguards regime will see an expanded reliance on the principle and technologies of CoK.

This paper will outline the new challenges of safeguarding the 21st century fuel cycle under the requirements for the SLA, why CoK is important in this new environment, what are the current gaps in today's technologies for successful future execution of CoK, and what technologies and approaches will be needed in the future.

---

[1] [1]Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

[2] [2]This manuscript has been authored by UT-Battelle LLC under Contract No. DE-AC05-00OR22725 with the U.S. Department of Energy. The United States Government retains and the publisher, by accepting the article for publication, acknowledges that the United States Government retains a non-exclusive, paid-up, irrevocable, world-wide license to publish or reproduce the published form of this manuscript, or allow others to do so, for United States Government purposes.