Critical Experiment Training at Sandia

Nuclear Criticality Safety Program Technical Seminar

Oak Ridge National Laboratory
March 2, 2011

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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.

Sandia Will Be Offering Critical Experiments Training

- **Sandia's FY11 NCSP T&E deliverables**
  - **Conduct one pilot hands-on training class (RTBF Level 2 Milestone) (Q4)**
  - **Obtain DOE authorization to achieve criticality using water height and/or control rods (RTBF Level 2 Milestone) (Q4)**
- **Sandia's FY12 NCSP T&E deliverable**
  - **Conduct classes in accordance with the approved schedule and provide status reports on all training activities in NCSP Quarterly Progress Reports (Q1, Q2, Q3, Q4)**

Why Have Critical Experiments Training at Sandia?

- We have an operating critical experiments facility
- Our experiments are security category IV E
  - Our experiments are located in a limited area
  - With GERT and evacuation training, L- and Q-cleared personnel can be unescorted outside the reactor room
  - Escorted access by uncleared US citizens is possible
  - Access by foreign nationals is possible with some planning

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We operate our critical experiments in the Sandia Pulsed Reactor Facility (SPRF)

- The course will be offered in the critical experiments control room area
- Modifications will be made to separate the classroom from the adjacent control area

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The Draft Course Syllabus

- Fundamentals
- Accidents from a critical experiments perspective
- Critical experiment design
- Critical experiment execution
- Critical experiment benchmark documentation
- Critical experiment laboratory exercises (interspersed)

All course content will be focused on application to the laboratory exercises

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Potential Laboratory Exercises

- Subcritical, critical, or supercritical?
- Approach-to-critical on moderator level
- Approach-to-critical on fuel loading
- Fuel/moderator interaction effects
- Reflector effects
- UNM AGN-201 experiment

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Critical Experiments at Sandia