

US DOE NCSP Training and Education Program Plan*

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INTRODUCTION

The Oak Ridge National Laboratory (ORNL) was tasked by the US Department of Energy (DOE) Nuclear Criticality Safety Program (NCSP) to coordinate the development of a new and extended two-week US DOE Nuclear Criticality Safety Engineer (NCSE) Hands-on Training and Education course. This paper provides the description of the development, execution, and refinement of the new course that will be offered in 2012.

BACKGROUND

In May 1973, the University of New Mexico conducted the first nationwide criticality safety training and education week-long short course for nuclear criticality safety engineers[1]. Subsequent to that course, the Los Alamos Critical Experiments Facility (LACEF) developed very successful “hands-on” sub-critical and critical training programs for operators, supervisors, and engineering staff. Since the inception of the US Department of Energy (DOE) Nuclear Criticality Technology and Safety Project (NCT&SP) in 1983, the DOE has stimulated contractor facilities and laboratories to collaborate in the furthering of nuclear criticality as a discipline[2]. That effort included the education and training of nuclear criticality safety engineers (NCSE). In 1985, a textbook was written[3] that established a path toward formalizing education and training for NCSEs[4]. Though the NCT&SP went through a brief hiatus during 1990 to 1992, other DOE-supported programs were evolving to the benefit of NCSE training and education[5]. As described [6], in 1993, the DOE established their Nuclear Criticality Safety Program (NCSP) and undertook a comprehensive development effort to expand the extant LACEF “hands-on” course specifically for the education and training of NCSEs. That successful education and training was interrupted in 2006 for the closing of the LACEF and the accompanying movement of materials and critical experiment machines to the Nevada Test Site. Prior to that closing, the Lawrence Livermore National Laboratory was commissioned to establish an independent “hands-on” NCSE sub-critical education and training course [7]. That course provided an interim transition for the establishment of a reinvigorated and expanded two-week NCSE hands-on experiments and facility/classroom education and training program in 2011. The 2011

piloted two-week course is coordinated by the Oak Ridge National Laboratory (ORNL)[8] and jointly conducted by the Los Alamos National Laboratory (LANL), Sandia National Laboratory (SNL), and the Nevada National Security Site Critical Experiments Facility (CEF)[9]. This recent effort represents a significant development in training for nuclear criticality safety engineers.

PROGRAM PLAN DESCRIPTION

This presentation provides the description about the objective of the Project, its bases, development, content, design, and conduct of the piloted, and future, US DOE NCSP NCSE Training and Education Project (T&EP) courses. It will include the descriptions of the general course objective, description of course contents, facility accommodations for conducting the classroom and hands-on experiments, and the intellectual resources for the course development. The objective of the Project is to supplement NCSE training and education that is typically not available from the employer (i.e., hands-on critical and sub-critical experiment training in experiments facilities, centralized education in DOE Headquarters regulatory interpretations and expectations for site nuclear criticality safety programs, and the performance of process analyses and nuclear criticality safety evaluations). The bases of the T&EP course comes from the consolidation of prior training courses from the Los Alamos National Laboratory, Lawrence Livermore National Laboratory, Sandia National Laboratory, and supplemental subject matter developed by Sandia National Laboratory, Oak Ridge National Laboratory, and the US DOE NCSP Criticality Safety Coordinating Team (CSCT). The CSE T&EP course content was developed by that team of national laboratories with the Oak Ridge National Laboratory providing planning and coordination in the development and conduct of the course.

Additionally, the presentation will describe the results of the first pilot presentation of the two-week course in 2011 and adjustments that have been made in course content in final preparation for the first four course presentations to be provided in 2012.

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