



LAWRENCE
LIVERMORE
NATIONAL
LABORATORY

Status Of The National Ignition Campaign And National Ignition Facility Integrated Computer Control System

L. Lagin, G. Brunton, R. Carey, R. Demaret, J. Fisher,
B. Fishler, P. Ludwigsen, C. Marshall, R. Reed, R.
Shelton, S. Townsend

March 22, 2011

ICALEPCS 2011
Grenoble, France
October 10, 2011 through October 14, 2011

STATUS OF THE NATIONAL IGNITION CAMPAIGN AND NATIONAL IGNITION FACILITY INTEGRATED COMPUTER CONTROL SYSTEM*

L. Lagin, G. Brunton, R. Carey, R. Demaret, J. Fisher, B. Fishler, P. Ludwigsen, C. Marshall, R. Reed, R. Shelton, S. Townsend

Lawrence Livermore National Laboratory, P.O. Box 808, Livermore, California USA

ABSTRACT

The National Ignition Facility (NIF) at the Lawrence Livermore National Laboratory is a stadium-sized facility that will contain a 192-beam, 1.8-Megajoule, 500-Terawatt, ultraviolet laser system together with a 10-meter diameter target chamber with room for multiple experimental diagnostics. NIF is the world's largest and most energetic laser experimental system, providing a scientific center to study inertial confinement fusion (ICF) and matter at extreme energy densities and pressures. NIF's laser beams are designed to compress fusion targets to conditions required for thermonuclear burn. NIF is operated by the Integrated Computer Control System (ICCS) in an object-oriented, CORBA-based system distributed among over 1800 front-end processors, embedded controllers and supervisory servers. In the fall of 2010, a set of experiments began with deuterium and tritium filled targets as part of the National Ignition Campaign (NIC). At present, all 192 laser beams routinely fire to target chamber center to conduct fusion and high energy density experiments. During the past year, the control system was expanded to include automation of cryogenic target system and over 20 diagnostic systems to support fusion experiments were deployed and utilized in experiments in the past year. This talk discusses the current status of the NIC and the plan for controls and information systems to support these experiments on the path to ignition.

* This work performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.