

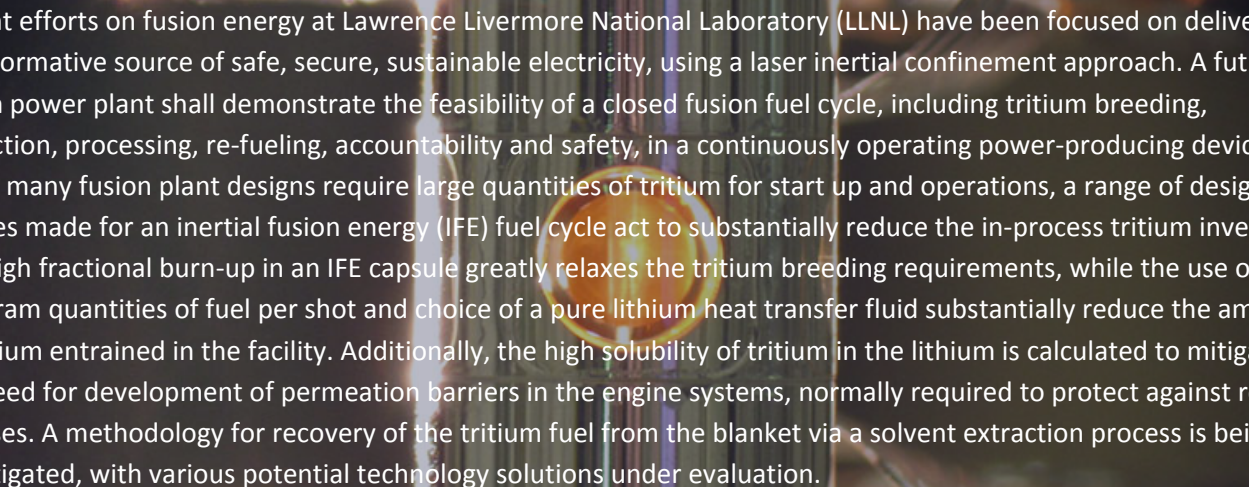
American Nuclear Society  
Northern California Section  
Dinner Meeting

*Closing the fusion fuel cycle: tritium recovery and processing*

Thursday May 15, 2014

Dr. Susana Reyes

NIF/IFE, Lawrence Livermore National Laboratory



Recent efforts on fusion energy at Lawrence Livermore National Laboratory (LLNL) have been focused on delivering a transformative source of safe, secure, sustainable electricity, using a laser inertial confinement approach. A future fusion power plant shall demonstrate the feasibility of a closed fusion fuel cycle, including tritium breeding, extraction, processing, re-fueling, accountability and safety, in a continuously operating power-producing device. While many fusion plant designs require large quantities of tritium for start up and operations, a range of design choices made for an inertial fusion energy (IFE) fuel cycle act to substantially reduce the in-process tritium inventory. The high fractional burn-up in an IFE capsule greatly relaxes the tritium breeding requirements, while the use of only milligram quantities of fuel per shot and choice of a pure lithium heat transfer fluid substantially reduce the amount of tritium entrained in the facility. Additionally, the high solubility of tritium in the lithium is calculated to mitigate the need for development of permeation barriers in the engine systems, normally required to protect against routine releases. A methodology for recovery of the tritium fuel from the blanket via a solvent extraction process is being investigated, with various potential technology solutions under evaluation.

(Work performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.)

ANS members and non-members welcome.

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or contact:

Tim Lloyd,

ANS NORCAL Program Chair

Email: [lloy1tm@westinghouse.com](mailto:lloy1tm@westinghouse.com)

Dinner: 6:30 p.m.

Program: 7:30 p.m.

Alfred's Steakhouse

659 Merchant Street

San Francisco, CA 94111