

SNL/CA Agency Update

Gordon Gibbs

IMOG Joining Subgroup
Los Alamos National Lab.
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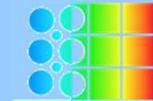
Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under Contract DE-AC04-94AL85000.

Welding Operations at SNL/CA

- ★ 8200 National Security Engineering
 - ◆ 8224 Gas Transfer Systems
 - Manager - Chuck Cadden
 - ◆ G. Ken Hicken
 - ◆ Gordon Gibbs
 - ◆ Tony De Sousa
 - ◆ Rich Campiotti
 - ◆ Annette Newman

Welding Operations at SNL/CA

- ★ 8700 Materials & Engineering Science
 - ◆ 8758 Analytical Materials Science
 - Manager - RION A. CAUSEY
 - ◆ Joe Puskar



Materials & Engineering
Sciences Center
Atoms to Continuum

FY07 Joining Activities

Gordon Gibbs & Tony De Sousa

- ★ Weapons Support
- ★ Hardware Fabrication
- ★ Equipment Characterization
- ★ Weld Acceptance using Data Acquisition
- ★ Aluminum Pressure Vessel Welding

FY07 Joining Activities

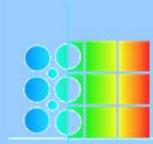
G. Ken Hicken

- ★ W80 Weld Processes
- ★ W87 JTA Weld Processes
- ★ W R Production Liaison
- ★ Orbital Tube Weld Characterization

FY07 Joining Activities

8758 Engineered Materials Dept.

- ✿ **Beryllium (S-65C) to Copper Alloy (Cu-Cr-Zr) diffusion bonding for ITER fusion reactor in Cadarache France via hot isostatic pressing**
 - ◆ The US has reentered after almost a decade
 - ◆ Technical Constraints
 - Cu alloy aging temperature restrictions
 - Activation of Metals – No Au or Ag interlayers
 - Service Temperature – No Al interlayers
 - ◆ Intermetallics require Ti and Cu layers – currently PVD
 - ◆ Significant logistical issues for SNL/CA to handle Be
 - ◆ Cu overaging for “realistic joining scenarios” appears to be a big issue
 - Large efforts into understanding CuCrZr aging characteristics
- ✿ **Inertia Welding Research**
 - ◆ Much reduced program to support GTS activities
 - ◆ Possible small study of nanocrystalline aluminum alloys
- ✿ **Materials Research – 22-13-5 Nitronic 50**
 - ◆ Explore the rapid sigma phase formation from ferrite in GTA welds – collaborating with LLNL
- ✿ **Other Activities**
 - ◆ Expanded support of the GTS welding laboratory
 - ◆ Continued technical support for GTS
 - ◆ Weld metal mechanical property weldments



New Equipment

- ★ Resistance Upset Welder (Upgrades)
- ★ New Multi-Process Data Acquisition System