# Receiving the Gordon Bell Award for the Salinas Code

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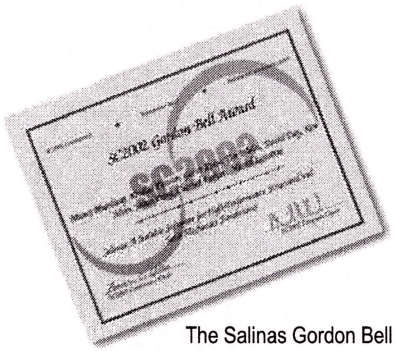
*Salinas won the prestigious 2002 Gordon Bell Award for special accomplishment in supercomputing based on innovation.*



The Salinas Gordon Bell award certificate presented at Supercomputing 2002 conference.

## Description

The Sandia-developed, ASC structural dynamics simulation code, Salinas, won the prestigious 2002 Gordon Bell Award for special accomplishment in supercomputing based on innovation. Salinas is a massively parallel code for modeling high-fidelity shock and vibration response of full-body weapons systems.

## Technical Significance

Salinas sustained a performance of 1.16 teraOPS on 3375 processors of ASC White—an ASC supercomputer at Lawrence Livermore National Laboratory. This performance is about 30% of the possible peak rate for the number and type of processors used. The code also achieved unprecedented scalability for an implicit simulation code, demonstrating a constant solution time as the problem and computational resources were proportionally increased. Significantly, Salinas provided this performance as a general purpose code —a code that can be used to model and simulate a wide range of structural and mechanical systems, ranging from microElectroMechanical systems (MEMS) devices to aircraft carriers.

## Contribution to the Stockpile Stewardship Program (SSP)

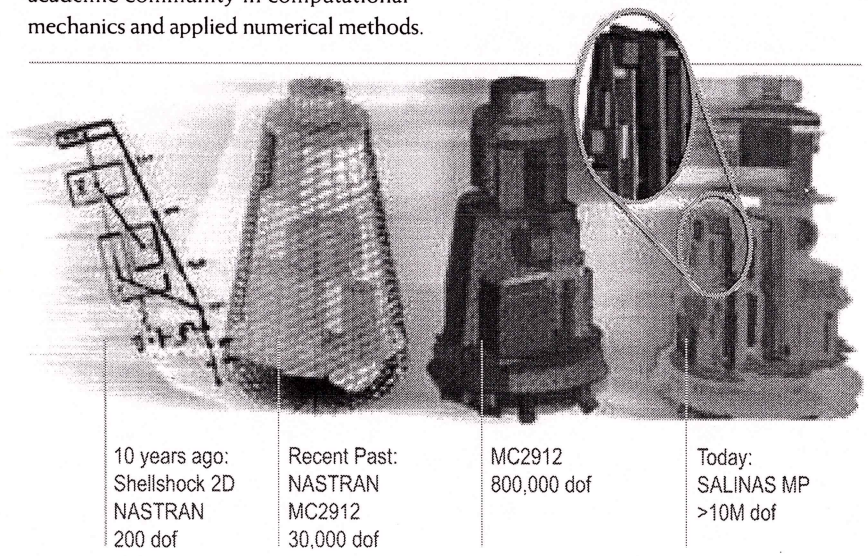
Salinas, which has just completed its first formal release to the Nuclear Weapons Complex, is already having a significant impact on modeling, simulation, and qualification activities for the Stockpile Stewardship Program. Specifically, Salinas is one of a suite of codes that address the system-level mechanical qualification issues for stockpile-to-target sequence (STS) hostile environments for the W76-1 life extension program, and STS normal environments for the W76-1 and W80 programs. Salinas is the only ASC code designed to address low-frequency shock and random vibration events, such as launch, re-entry induced vibration, and blast response.

## Benefits to ASC and to Sandia

Salinas has established ASC and Sandia as leaders in the development of scalable and robust parallel solvers for engineering simulation, and as partners with the academic community in computational mechanics and applied numerical methods.

## Future Developments

Salinas is currently focusing on a number of important development activities to extend its impact on the Stockpile Stewardship Program and the computational structural dynamics discipline in general. These activities include multi-physics coupling through the Sandia Integrated Environment for Research and Robust Analysis (SIERRA) mechanics framework, integration of contact capabilities in the parallel iterative solver, and the development and implementation of advanced methods in structural acoustics.




The Salinas code developed by ASC, together with the ASC-enabled explosion in computer hardware, allows more sophisticated structural dynamics modeling.