GUSTAVO A. ARAMAYO

EDUCATION

- B.S. Civil Engineering (structures), University of Alabama at Tuscaloosa, 1963.
- M.S. Engineering Mechanics (solid mechanics), University of Alabama at Tuscaloosa, 1964.
- Ph.D. student, Engineering Mechanics (dynamics and vibrations), University of Alabama at Huntsville, 1967-1973.

QUALIFICATIONS

- Registered Professional Engineer- Tennessee registration #9117
- Boiler and Pressure Vessel Code, Sections III and VIII
- Advanced LS-Dyna Training, Vehicle Crash Worthiness and Impact Analysis
- DOE certification for SARP review
- DOE certification on 'Qualification Testing of Transport Packaging for Radioactive Materials'
- DOE-Y12 Nuclear Packaging Systems certified to 'perform Mechanical Design Engineering and activities related to Radioactive Materials Packaging'
- ANS Containment Workshop
- DOE Workshop on the Design and Evaluation Guidelines for DOE Facilities
- PATRAN User's course
- TRUEGRID User's course
- Workshop on the 'Modeling of Structures Using Finite Element Codes'

AFFILIATIONS

Membership in: American Society of Civil Engineers; The Materials-Metals Society; the Structural Engineers Institute; Sigma Chi (scientific organization); Tau Beta Pi (engineering organization); Chi Epsilon (civil engineering organization); and Pi Mu Epsilon (mathematics organization).

HONORS AND AWARDS

- DOE Significant Event Award, "Metal Forming Analysis and Simulation", 1987.
- DOE Nuclear Weapons Program. Award of Excellence, Technical Achievement, "Development and Implementation of the Quench Program", 1992.
- DOE Nuclear Weapons Program. Award of Excellence, Technical Achievement, "Development of the Reverse Blow Forming Process to Fabricate Near-Net-Shape Weapon Component Parts", 1993.
- International Hall of Fame, Advanced Technology Award, 1993.
- Martin Marietta Energy Systems. Technical Achievement Award Night 1993. "Superplasticty Forming", 1993.
- Martin Marietta Energy Systems, Central Engineering Division. Director's Technical Achievement Award, "Stability of Refractory Linings in Lime Kilns", 1997.

EXPERTISE AND ACHIEVEMENTS

- Developed mathematical models and conducted impact analysis of weapon component containers, spent fuel casks and passenger vehicles.
- Mechanical-thermal simulation of Stir-welds.
- Structural optimization of energy absorbing mechanisms to minimize damage associated with frontal collision of passenger vehicles.

- Thermo-mechanical analysis and simulation of deep penetration weldements.
- Performed safety analysis review for mechanical upgrades of the DOE High Flux Isotope Reactor.
- Thermo-mechanical analysis of transfer rollers.
- Seismic analysis of facilities and components.
- Aero-elastic stability analysis of large heat exchangers.
- Failure analysis of facilities and components.
- Seismic analysis of submerged spent fuel racks, including effects of fluid structure interaction.
- Performed forming analysis, simulation of processes, and optimization of tooling.
- Modal analysis and modal coupling of payloads and launch vehicles.
- Developed equations of motion for large multi-tube rocket launchers.
- Developed digital programs for determining vibration characteristics of launch vehicles.
- Conducted analysis of pressure vessel and piping, and developed computer programs for these analyses.
- Developed equation systems of motion for large space structures, and used these equation systems to predict initial conditions of space-structure components.
- Conducted wing-flutter analyses, and developed predictive tools for this application...
- analyzed the response of a gas centrifuge enrichment facility component to seismic disturbance.

PROFICIENCY AND TECHNICAL SKILLS

- Non-linear Finite Element modeling and analysis using Massive Parallel computers
- Familiar with DOE Orders, SARP Requirements, ASME B&PVC, 10 CFR 71 and 73 requirements as applied to shipping container design and qualifications
- Computer programming using FORTRAN for UNIX and PC based computers
- Fluid-structure interaction analysis
- Proven ability to analyze dynamic effects associated with impact, natural phenomena, penetration and detonation
- Forming simulation analysis and tool design: thin metal forming, deep forging, and super-plastic procedures
- Proficient in the use of the following computer programs: LS-DYNA, LS-NIKE, Topaz, ABAQUS, Gemini, SAP, True-Grid, Taurus, Patran
- Fluent in Spanish, working knowledge in French

PROFESSIONAL EXPERIENCE

1998-Present: Oak Ridge National Laboratory, Computer Sciences and Mathematics Division, Senior Research Staff, Oak Ridge, Tennessee.
1982-1998: Lockheed Martin Energy Systems, iY-12 Plant-Central Engineering, Engineering Analysis, Senior Staff Engineer, Oak Ridge, Tennessee.
1981-1982: Westinghouse Electric Corporation, Advance Reactors Division, Senior Engineer, Pensacola, Florida.
1974-1981: Union Carbide Corporation, Oak Ridge National Laboratory, Engineering Division, Engineering Analysis, Engineer Specialist, Oak Ridge, Tennessee.
1973-1974: Applied Mechanics Research, Research Engineer, Huntsville, Alabama
1967-1973: Northrop Corporation, Dynamics and Controls, Structures group, Lead Engineer, Huntsville, Alabama.
1966-1967: Martin Aerospace, Dynamics and Loads, Senior Engineer, Denver, Colorado.
1965-1966: Lockheed Engineering Research Center, Methods Development Group, Associate Engineer, Huntsville, Alabama.

SELECTED PUBLICATIONS

1. Collaborative Toolkit for Crashworthiness Research. Internal ORNL Report (2001).

2. Parametric Finite Element Model of a Sports Utility Vehicle- Development and Validation- Paper presented at the 7th International LSDYNA User's Conference (2001).

3. Advance Computational Simulation for Design and Manufacturing of Lightweight Material Components for Automotive Applications. ORNL/TM-13407 (2002).

4. Development of a Finite Element Model of a 1998 Audi A8 for Crash Analysis. Internal ORNL Report (2003).

5. Design Optimization of an SUV for Crashworthiness with a Small Passenger Vehicle. Internal ORNL Report (1998).

6. Steel Processing Effects on Impact deformation of Ultra Light Steel Auto Body, SAE technical Paper 2001-01-1056 (2001).

7. Crash Compatibility of the Ultra Light Steel Auto Body (ULSAB) with Cars of the Same Size, SAE paper 00IBECD-9 (2002).

8. Sequential Impact Analysis of the DT-23 Package with 'SKUA' Burst Reactor Fuel Ring Content, DAC-EA-801534-A001 (2003).

9. Analysis of GPNAA Lab Hot Cell Impact Loading, C-HFIR-2003-011 (2003).

10. Tornado Analysis of the G-13 Battery Room Wall, C-HFIR-2004-008 (2004).

11. Steel Processing Properties and Their Effect on Impact Deformation of Lightweight Structures, ORNL/TM-2002/148 (2002).

12. Impact Analysis of the DC-1 Shipping Container- Paper presented at the 2nd- DOE Transportation Congress, Oak Ridge TN (1997).

13. Advanced Computational Simulation for Design and Manufacturing of Lightweight Material Components for Automotive Applications, ORNL/TM-13407 (1998).

14. Recent Experience in Planning, Packaging and Preparing Noncommercial Spent Fuel for Shipment in the United States, paper presented at the PATRAM'98 conference, Paris, France (1998).

15. Modeling of Thermal Stresses in GTA Welds, Paper presented at the International Conference on Modeling and Control of Joining Processes (1998).

16. The DT-19 Container- Design, Impact Testing and Analysis, Paper presented at the 1996 ASME P&V Conference (1996).

17. On the Stability of Refractory Lining in Lime Kilns, paper presented at the 1998 ASME P&V Conference (1998).

18. Impact Analysis of Stainless Steel Spent Fuel Canisters, paper presented at the 1998 ASME P&V Conference (1998).