GEORGIA INSTITUTE OF TECHNOLOGY — OFFICE OF CONTRACT ADMINISTRATION

PROJECT ADMINISTRATION DATA SHEET

[X] ORIGINAL [ ] REVISION NO. _____

Project No. E-25-M11 (R6172-0A0) GTRC/~~GIT~~ DATE 9 / 2 / 86

Project Director: D. L. McDowell School/~~Lab~~ ME

Sponsor: Martin Marietta Energy Systems

Type Agreement: Subcontract No. 19X-55966C

Award Period: From 6/1/86 To 9/30/86 (Performance) 9/30/86 (Reports)

Sponsor Amount:	This Change	Total to Date
Estimated: $		$ 32,000
Funded: $		$ 32,000

Cost Sharing Amount: $ _____ Cost Sharing No: N/A

Title: Anisotropy of Creep-Fatigue Deformation and Damage Under Nonproportional Loading

ADMINISTRATIVE DATA

OCA Contact John B. Schonk X4820

1) Sponsor Technical Contact:

R. L. Huddleston
Martin Marietta Energy Systems
P. O. Box M
Oak Ridge, TN 37831
615-574-0724

2) Sponsor Admin/Contractual Matters:

J. E. Shultz
Subcontract Administrator
Martin Marietta Energy Systems
P. O. Box M
Oak Ridge, TN 37831
615-576-1448

Defense Priority Rating: N/A Military Security Classification: N/A

(or) Company/Industrial Proprietary: N/A

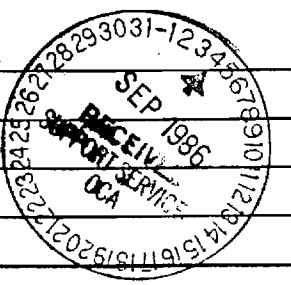
RESTRICTIONS

See Attached _____ Supplemental Information Sheet for Additional Requirements.

Travel: Foreign travel must have prior approval — Contact OCA in each case. Domestic travel requires sponsor approval where total will exceed greater of $500 or 125% of approved proposal budget category.

Equipment: Title vests with Gov't; however none proposed

COMMENTS:



SPONSOR'S I. D. NO. _____

COPIES TO:

Project Director	Procurement/GTRI Supply Services	GTRC
Research Administrative Network	Research Security Services	Library
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Accounting	Research Communications (2)	Other A. Jones

FORM OCA 65:285

GEORGIA INSTITUTE OF TECHNOLOGY OFFICE OF CONTRACT ADMINISTRATION

SPONSORED PROJECT TERMINATION/CLOSEOUT SHEET

Date 12/12/86

Project No. E-25-M11 School/~~Lab~~ ME

Includes Subproject No.(s) N/A

Project Director(s) D. L. McDowell GTRC / ~~GMX~~

Sponsor Martin Marietta Energy Systems

Title Ansiotropy of Creep-Fatigue Deformation and Damage under Nonproportional Loading

Effective Completion Date: 9/30/86 (Performance) _____ (Reports)

Grant/Contract Closeout Actions Remaining:

- [ ] None
- [X] Final Invoice or Final Fiscal Report
- [X] Closing Documents
- [X] Final Report of Inventions - Questionnaire sent to P.I.
- [X] Govt. Property Inventory & Related Certificate
- [X] Classified Material Certificate
- [ ] Other _____

Continues Project No. _____ Continued by Project No. _____

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Other I. Lashley
A. Jones
R. Embry

FORM OCA 69.285

MARTIN MARIETTA ENERGY SYSTEMS

PROGRESS REPORT

ANISOTROPY OF CREEP-FATIGUE DEFORMATION AND DAMAGE UNDER NONPROPORTIONAL LOADING

FOR THE PERIOD

JUNE 1, 1986 THROUGH JULY 31, 1986

D. L. McDOWELL
SCHOOL OF MECHANICAL ENGINEERING
GEORGIA INSTITUTE OF TECHNOLOGY
ATLANTA, GEORGIA 30332
PROJECT NO. E-25-M11

ATTENTION: R.L. HUDDLESTON
MARTIN MARIETTA ENERGY SYSTEMS
P.O. BOX M
OAK RIDGE, TN 37831

JULY 1986

WORK UNDERWAY

Test histories have been received for Specimens GT-4A, GT-5, and Gt-6. We are still awaiting shipment of the specimens for sectioning and analysis.

Work is proceeding in five well-defined areas to enhance the accuracy of the anisotropic damage framework established in an earlier contract. Specifically, these areas include:

A. Plots of damage distribution in the specimen wall to assess the appropriateness of a second-order damage tensor for nonproportional loading.

B. Introduction of unified creep-plasticity equations to more accurately account for creep-plasticity interaction.

C. Referencing the isochronous to the backstress from the unified creep-plasticity equations for power-law creep to more accurately prescribe damage rate under nonproportional loading conditions.

D. Investigation of appropriate coupled stress-damage rupture criterion, and

E. Generalization of a second-order damage rate equation to match the directional creep damage distribution.