

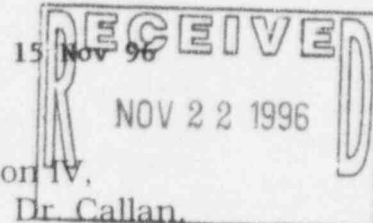


REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
U.S. ARMY WHITE SANDS MISSILE RANGE
WHITE SANDS MISSILE RANGE, NEW MEXICO 88002-



STEWS-DT-O (70)



MEMORANDUM FOR U.S. Nuclear Regulatory Commission, Region IV,
611 Ryan Plaza Drive, Suite 400, ATTN: Dr. Callan,
Arlington, TX 76011

SUBJECT: Engineering Study of the Gamma Range Facility (GRF) Source
Carrier and Transfer Process

1. Pursuant to your 24 Oct 96 letter (Docket Number: 030-0935, License Number: 30-02405-01, Confirmatory Action Letter, U.S. Nuclear Regulatory Commission, Region IV), this organization respectfully submits the following enclosed plan and proposed schedule to be incorporated in License Number 30-02405-01, by reference.
2. Please find the enclosed plan and schedule as this organization's approach in addressing the GRF Medium Source Carrier Failures. This organization will utilize an outside consulting agent (Mechanical Engineering Department, New Mexico State University) to perform the actual study. In general, the study will determine the underlying causes of the failure of the source carrier and capsule assembly. As a result of the engineering analysis, develop a set of design modifications and/or operating procedural changes. Based on the findings and conclusions of the study, conduct a validation study to support the design changes.
3. Subject study will specifically address failures to GRF Medium Sources #5 and #8 (Serial Nos. 175-90-4 and 175-90-1), but will also include an assessment of all other medium, large, and cesium sources. Once the engineering analysis is complete White Sands Missile Range will submit to the NRC for review any design modifications and/or operations procedural changes. Prototype testing will follow new design and procedural changes to validate and support the effectiveness prior to final implementation.
4. Request your issuance of this submittal in the form of a license amendment.

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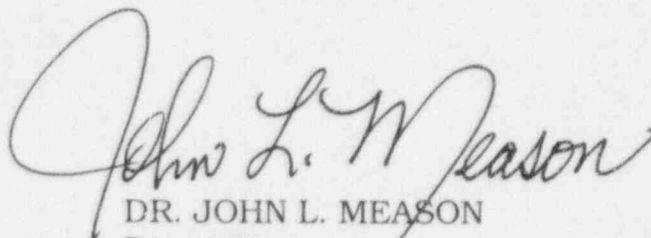
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STEWS-DT-O

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Carrier and Transfer Process

5. Any questions in this regard, please contact either Mr. Roland Penny or
Mr. Richard Williams, 505-678-4161 or 2699.

FOR THE COMMANDER:



DR. JOHN L. MEASON

Director

Applied Technology, Test and
Simulation

Encl

CF:

Cdr, TECOM, ATTN: AMSTE-SM-S (Mr. Aaserude), APG, MD 21005-5055

Cdr, AMC, ATTN: AMSCF-P (Mr. J. Manfre), 5001 Eisenhower Avenue,
Alexandria, VA 22333-0001

Department of Mechanical Engineering



New Mexico State University
Box 30001/Las Cruces, New Mexico 88003-0001 USA
Telephone (505)646-3502 FAX (505)646-6111

DATE: 11/13/96

TO: Mr. Roland Penny
Division Chief
Operations and Support Division
STEWS-DT-O
WSMR, NM 88002

FROM: Edgar Conley
Associate Professor
econley@nmsu.edu
(505)646-5698

A handwritten signature, likely of Edgar Conley, consisting of stylized initials and a surname.

RE: Failure Analysis and Remediation

Dear Sir,

This proposal responds to the NRC Region IV letter dated 10/24/96. Three objectives and a schedule to obtain them within a reasonable time frame are proposed.

1. The first objective is to determine the underlying causes of the failure of the cobalt source carrier/capsule assembly. We propose an engineering evaluation of the assembly that will include, but not be limited to, the effects of the assembling operation (e.g. preload), material properties (particularly those related to fatigue strength), potentially destructive vibrational modes of the assembly, stress concentrations in both the capsules and carriers, short and long term effects of gamma radiation on the material properties, and operating parameters that affect carrier accelerations. We shall also assess the two remaining carriers and, based upon their nominal use, evaluate the expected residual life. During this phase, we shall rely on the DATTS staff to

provide the pneumatic conveyor system operating information which is required to model the carrier accelerations and resulting stresses.

2. The second objective is to generate and submit for review a set of design changes in any or all of the components that affect the physical loads imposed on the source capsules. This plan will have as its basis the engineering evaluation of step one. Potential design changes will include, but not be limited to, the design and assembly of the carriers and capsules, the pneumatic conveyance, the operating procedures and parameters that affect the system operation, and the air handling system.

Inherent in the engineering evaluation of step one is a sensitivity analysis which should help indicate the most critical among the many engineering parameters that affect the carriers. Thus, the evaluation should provide some indication of the loading conditions that should be confirmed - by a series of field and/or laboratory tests, if necessary. This decision, whether to conduct such tests at the WSMR site or at the PI's laboratories, and which tests to conduct, shall be made in concert with the DATTS staff.

Finally, the above mentioned sensitivity analysis should help indicated the most economic means toward sensible design changes, those that maintain the effectiveness of the facility, if such changes are deemed necessary.

3. The third objective is to propose for review a validation study to determine the extent to which the design changes under consideration as a result of step two ameliorate the potential for capsule/carrier failure during the anticipated lifetime.

Schedule:

| | | |
|------------------------|--------------------|--------------------|
| Engineering Evaluation | duration 6 months | Jan '97 - June '97 |
| Design Modifications | duration 2 months | July '97 - Aug '97 |
| Validation Study | duration 12 months | Sept '97 - Aug '98 |