

National Aeronautics and
Space Administration

John F. Kennedy Space Center
Kennedy Space Center, Florida
32899

NASA

1616

Reply to Attention of: MD-D

MAY 23 1979

MR. NATHAN BASSIN
NUCLEAR REGULATORY COMMISSION
DIVISION OF FUEL CYCLE AND MATERIAL SAFETY
LICENSE MANAGEMENT BRANCH
WASHINGTON, D.C. 20555

SUBJECT: APPLICATION FOR BYPRODUCT MATERIAL LICENSE OF BROAD SCOPE

- REFERENCES:
1. NASA/KSC (MD) LETTER FORWARDING SUBJECT APPLICATION TO NRC, DATED 17 NOV 78
 2. NRC LETTER REQUESTING FURTHER INFORMATION OF KSC, DATED 24 JAN 79
 3. NRC FOLLOW-UP LETTER WITH 30-DAY DEADLINE, DATED 1 MAY 79

THE ATTACHED SUPPLEMENTAL INFORMATION CONCERNS OUR SUBJECT APPLICATION AND SPECIFICALLY ADDRESSES THOSE ELEMENTS REQUESTED IN REFERENCE 2.

WE REGRET THE ELAPSED TIME BETWEEN YOUR EARLIER CORRESPONDENCE AND OUR RESPONSE. DUE TO INCREASED WORKLOADS IN THE AREA OF RADIATION PROTECTION, CORRESPONDENCE AND DOCUMENTATION EFFORTS HAVE NECESSARILY BECOME SECONDARY TO THE DAY-TO-DAY IMPLEMENTATION OF THE RADIATION PROTECTION PROGRAM. HOWEVER, WE UNDERSTAND THAT OUR ORIGINAL LICENSE NO. 09-11149-02 IS STILL IN FORCE TO COVER THE ACTIVITIES INVOLVING RADIATION SOURCES HERE AT KSC. MOREOVER, THOUGH OUR CRITICAL DOCUMENT, KHB 1860.1, "RADIATION PROTECTION HANDBOOK," REQUIRES UP-DATING FOR THE SHUTTLE ERA OF SPACE ACTIVITIES, THE CURRENT VERSION IS NONETHELESS A VALID OPERATIONAL INSTRUMENT AT THE CENTER.

WE HOPE THIS ADDITIONAL INFORMATION RESPONDS TO YOUR REQUESTS SUFFICIENTLY TO PERMIT SATISFACTORY COMPLETION OF YOUR REVIEW. WE WISH TO POINT OUT THAT THE DEVELOPMENT OF OUR ORIGINAL APPLICATION FOLLOWED CLOSELY THE STIPULATION OF REGULATORY GUIDE 10.5, AND CAPITALIZED ON THE GUIDANCE PROVIDED BY THOROUGH COMPARISONS WITH OTHER BROAD SCOPE TYPE A LICENSE APPLICATIONS PREVIOUSLY SUBMITTED TO THE NRC BY OTHER NASA CENTERS AND NON-NASA ORGANIZATIONS. THE SUPPLEMENTARY INFORMATION SUPPLIED HEREIN HAS BEEN ASSEMBLED AFTER CLOSE SCRUTINY OF YOUR JANUARY 1979 LETTER, BY STRICT ADHERENCE TO

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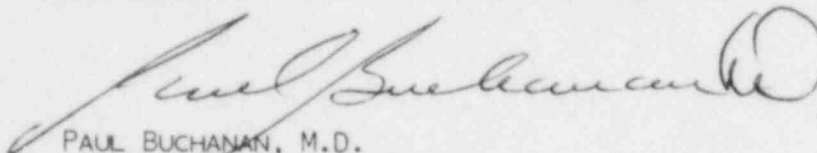
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THE REGULATORY GUIDE 10.5, AND UPON CRITICAL FURTHER COMPARISONS WITH APPROVED LICENSE APPLICATIONS SUBMITTED BY OTHER NASA CENTERS.

TO EXPLAIN WHY NASA/KSC IS APPARENTLY REQUIRED TO FURNISH SUCH DIFFERENTIAL SPECIFICITY AND DETAIL IN OUR APPLICATION PERPLEXES US, PARTICULARLY IN VIEW OF THE FACT THAT THE KSC RADIATION PROTECTION PROGRAM HAS LONG BEEN OFFICIALLY RECOGNIZED BY THE USNRC, USDOE, AND THE FLORIDA STATE DEPARTMENT OF HEALTH AND REHABILITATIVE SERVICES AS EMINENTLY ACCEPTABLE. THIS IS THE MORE CONSTERNATING UPON RECOUNTING THE PAST RECORD OF OUR PROGRAM AND (WE THINK WITH REASONABLE OBJECTIVITY) ITS QUALITY EQUALLING OR EXCEEDING THAT OF OTHER NASA CENTERS AS WELL AS MANY OTHER COMMERCIAL AND INDUSTRIAL, LICENSED OPERATIONS.

IF THERE ARE ANY FURTHER QUESTIONS REGARDING OUR APPLICATION AND SUPPLEMENTAL INFORMATION, WE WOULD WELCOME YOUR TIMELY INQUIRIES.



PAUL BUCHANAN, M.D.
DIRECTOR, BIOMEDICAL OFFICE

ENCLOSURES

~~SECRET~~

APPLICATION
FOR
BYPRODUCT MATERIAL LICENSE OF BROAD SCOPE
FOR NASA/KSC; SUPPLEMENTAL INFORMATION

RESPONSE TO PARA. 2

REGARDING THE COMMENTS IN PARAGRAPH 2 OF THE 24 JANUARY 1979 LETTER, THE PHRASE "UNDER REVISION" APPEARING IN OUR APPLICATION WAS INTENDED TO BE INTERPRETED IN ITS BROADER SENSE AND NOT TO IMPLY THAT THE FINAL ISSUANCE OF AN OFFICIALLY APPROVED DOCUMENT WAS IMMINENT. AT THE TIME OF OUR APPLICATION THE RELATED DOCUMENTS KMI 1860.1A AND 1150.9D HAD JUST BEEN REISSUED (NOVEMBER 15, 1978) AFTER LENGTHY RESEARCH, REVIEW, EVALUATION, STAFFING AND APPROVAL BY VARIOUS DIRECTORATES AND ORGANIZATIONS, AND THE PREPARATIONS TO REVISE KHB 1860.1 WERE JUST COMMENCING. DUE TO ONGOING EFFORTS IN OTHER AREAS, OUR TIMETABLE FOR REVISION OF THE DOCUMENT HAS EXPERIENCED SLIPPAGE AND PREPARATIONS TO DATE HAVE BEEN CONFINED TO THE RESEARCH, ASSEMBLAGE, AND COLLATION OF NUMEROUS REGULATORY CHANGES AND REVISIONS FOR EVENTUAL INCORPORATION INTO KHB 1860.1. IT SHOULD BE EMPHASIZED, HOWEVER, THAT THE BASIC FRAMEWORK OF CONTROLS, AUTHORITIES, AND RESPONSIBILITIES AS PRESENTED IN THE CURRENT KHB AND KMI'S ARE NOT PRO-JECTED TO CHANGE MATERIALLY SO AS TO AFFECT THE OVERALL PROGRAM INVOLVING IONIZING RADIATION PROTECTION. INDEED, THIS DOCUMENT CONTINUES TO BE INCORPORATED IN NUMEROUS OTHER RELATED NRC AND STATE OF FLORIDA LICENSES, APPLICATIONS, AND AMENDMENTS EMPLOYED BY BOTH NASA/KSC AND BY OTHER ORGANIZATIONS. FURTHERMORE, IT SHOULD NOT BE INFERRED THAT THE ACTUAL IMPLEMENTATION OF THE PROGRAM AT NASA/KSC IS NOT KEPT UP-TO-DATE AND CURRENT AS RELEVANT CHANGES AND ISSUANCES OF REGULATIONS, STANDARDS, AND GUIDES ARE PROMULGATED AND SUPERIMPOSED UPON THE EXISTING DOCUMENTS THROUGH BOTH ROUTINE AND SPECIAL REVIEWS AND REPORTS REGARDING OPERATIONS, FACILITIES, MATERIALS, AND PERSONNEL.

WE REGRET THAT THE LANGUAGE APPEARING IN OUR APPLICATION MAY HAVE MISLED YOU AND WE WOULD BE HAPPY TO SUBMIT REVISED PAGES WHICH OMIT THE WORDS "UNDER REVISION" AS REPLACEMENTS IF YOU SO DESIRE. IT IS OUR CONSIDERED OPINION THAT A PROPERLY REVISED AND APPROVED ISSUANCE OF KHB 1860.1 MAY TAKE FROM SIX TO 12 MONTHS TO ACCOMPLISH AND THAT THE CURRENT LICENSE APPLICATION REVIEW PROCESS WOULD BE BEST SERVED UTILIZING THE CURRENT DOCUMENTATION. THE REVISED DOCUMENT WILL BE SUBMITTED TO THE NRC FOR REVIEW, APPROVAL, AND INCORPORATION INTO THE LICENSE AT SOME FUTURE TIME BY WAY OF THE LICENSE AMENDMENT PROCESS. WE THEREFORE PROPOSE THAT THE DOCUMENTATION SUBMITTED WITH THE APPLICATION BE UTILIZED IN YOUR REVIEW. IN THE COURSE, THEREFORE, OF YOUR REVIEW OF THE KHB, WE RESPECTFULLY SOLICIT YOUR CONSTRUCTIVE COMMENTS AND/OR CRITICISMS FOR CONSIDERATION DURING OUR REVISION OF THE DOCUMENT.

RESPONSE TO PARA. 3

PARAGRAPH 3 INDICATES THAT THE APPLICATION DID NOT DEFINE THE TYPES AND QUANTITIES OF RADIOACTIVE MATERIALS INVOLVED, AND WRITTEN INSTRUCTIONS TO PERSONNEL TO USE SUCH MATERIALS, AT TEMPORARY JOB SITES. AS STATED IN THE SUPPLEMENT TO ITEM 1(B) OF THE REFERENCED APPLICATION, KSC ACTIVITIES MAY, AT TIMES, EXTEND TO OTHER TEMPORARY JOB SITES SUCH AS VARIOUS NASA, DOD AND OTHER FACILITIES. THIS IS PARTICULARLY TRUE WITH THE ADVENT OF NASA'S SPACE TRANSPORTATION SYSTEM (SPACE SHUTTLE) UNDER WHICH KSC HAS BEEN ASSIGNED THE SAFETY RESPONSIBILITIES FOR ALL SHUTTLE LANDING SITES INCLUDING CONTINGENCY SITES. IT WAS ALSO POINTED OUT IN THE SUPPLEMENT THAT " KSC RADIOLOGICAL ACTIVITIES AT TEMPORARY JOB SITES SHALL ADHERE TO THE KSC RADIATION PROTECTION PROGRAM REQUIREMENTS AS WELL AS LOCAL JURISDICTIONAL REQUIREMENTS."

UNDER THE PROVISIONS OF THE LICENSE REQUESTED FOR KSC RELATIVE TO TEMPORARY JOB SITES, THE REQUIREMENTS OF NASA KHB 1860.1/IS, " RADIATION PROTECTION HANDBOOK," NASA KMI 1860.1A, " RADIATION PROTECTION PROGRAM--POLICIES AND GENERAL PROVISIONS FOR IONIZING AND NON-IONIZING RADIATION," AND NASA KMI 1150.9D, " KSC RADIATION PROTECTION COMMITTEE," EXTEND TO, AND ARE APPLICABLE AT, TEMPORARY JOB SITES OF KSC.

WRITTEN PROCEDURES RELATIVE TO THE USE/HANDLING OF RADIOACTIVE SOURCES BY PERSONNEL ARE REQUIRED TO BE SUBMITTED TO THE KSC RADIATION PROTECTION COMMITTEE FOR REVIEW AND APPROVAL (REFERENCE KHB 1860.1/IS, SECTION II, PAGE 2-1, PARAGRAPH 2.3). SUCH PROCEDURES SUPPLEMENT DATA REQUIRED TO BE SUBMITTED FOR REVIEW AND APPROVAL BY THE RADIATION PROTECTION COMMITTEE PRIOR TO ISSUANCE OF A KSC RADIOACTIVE MATERIAL USE REQUEST (RMUR). OPERATIONS INVOLVING THE USE OF LICENSED RADIOACTIVE MATERIAL MUST BE AUTHORIZED BY AN RMUR PRIOR TO COMMENCEMENT OF ANY ACQUISITION AND USE OF SUCH MATERIALS.

DUE TO THE " TRANSIENT" NATURE OF MANY OPERATIONS UNDER THE PURVIEW OF KSC (KSC BEING THE ORGANIZATIONAL ELEMENT OF NASA RESPONSIBLE FOR ALL LAUNCH AND LANDING ACTIVITIES), IT IS IMPOSSIBLE TO FORECAST THE EXACT TYPE AND QUANTITIES OF RADIOACTIVE MATERIALS TO BE UTILIZED AT KSC AND ITS TEMPORARY JOB SITES. IT WOULD BE EQUALLY IMPOSSIBLE TO SUBMIT SPECIFIC WRITTEN PROCEDURES GOVERNING THE USE OF SOURCES WHICH CANNOT BE SPECIFICALLY IDENTIFIED AT THIS TIME FOR INCORPORATION INTO OUR LICENSE APPLICATION.

HISTORICALLY, RADIOACTIVE SOURCES WHICH HAVE BEEN USED AT KSC TEMPORARY JOB SITES (PRINCIPALLY VANDENBERG AFB), WERE MICROCURIE/MILLICURIE-SIZED FLIGHT AND GROUND CALIBRATION SOURCES. SUCH SOURCES HAVE BEEN EITHER SEALED OR PLATED.

THE CONCEPT OF THE BROAD SCOPE LICENSE WAS DETERMINED TO BE APPROPRIATE BY THE KSC RADIATION PROTECTION COMMITTEE FOR KSC'S TOTAL LAUNCH PROGRAM RESPONSIBILITIES AND NEEDS. THIS DETERMINATION WAS DUE, IN PART, TO THE DIFFICULTY OF PROJECTING SPECIFIC SOURCES TO BE UTILIZED, COUPLED WITH THE APPLICATION OF A SINGLE RADIATION PROTECTION PROGRAM TO ALL AREAS AND PERSONNEL UNDER KSC CONTROL INVOLVED IN SPACECRAFT TEST, CHECKOUT, LAUNCH AND LANDING FUNCTIONS FOR THE PRINCIPAL BENEFIT OF THE UNITED STATES GOVERNMENT.

RESPONSE TO PARA. 4

RELATIVE TO PARAGRAPH 4, WE CONSIDER YOUR COMMENTS VAGUE AND WE HAVE DIFFICULTY UNDERSTANDING SPECIFICALLY WHAT SECTIONS OF THE APPLICATION HAVE CAUSED YOU CONCERN. HOWEVER, IN AN ATTEMPT TO SATISFY WHAT WE HAVE ASSUMED TO BE OF CONCERN TO YOU, THE FOLLOWING EXPLANATIONS ARE SUPPLIED:

AS A GENERAL APPROACH TO YOUR COMMENTS IT SHOULD AGAIN BE NOTED THAT ALL CONTRACTORS, SUBCONTRACTORS, ETC., TO NASA/KSC OPERATE AT KSC/ CCAFS AND ITS TEMPORARY JOB SITES FOR THE BENEFIT OF THE U. S. GOVERNMENT. THE HEALTH PHYSICS SERVICES CONTRACTOR REFERENCED IN THE APPLICATION, IN PERFORMING ITS FUNCTION, PROVIDES AN INTEGRAL ELEMENT IN THE IMPLEMENTATION OF THE KSC RADIATION PROTECTION PROGRAM. THEIR INVOLVEMENT IN THAT PROGRAM IS SPECIFICALLY ADDRESSED WITHIN THE APPLICATION AND THE KHB 1860.1 AS SUBMITTED. IN PERFORMING THAT CONTRACTUAL FUNCTION, THEY ARE OBLIGED TO MAINTAIN NRC AND FLORIDA STATE RADIOACTIVE MATERIAL LICENSES FOR THE SPECIFIC BENEFIT OF NASA/KSC AND THE RADIATION PROTECTION PROGRAM. THERE ARE, NATURALLY, OTHER CONTRACTORS THAT HAVE INVOLVEMENT IN THE KSC RADIATION PROTECTION PROGRAM DUE TO THEIR NEED EITHER TO HANDLE RADIOACTIVE MATERIALS OR TO OPERATE RADIATION PRODUCING MACHINERY IN THE FULFILLMENT OF THEIR CONTRACTUAL OBLIGATIONS TO THE U.S. GOVERNMENT. AS SUCH, THEY ARE CLASSIFIED AS "USERS" AND NECESSARILY FALL UNDER THE PURVIEW OF THE RADIOLOGICAL CONTROLS AND REQUIREMENTS AS EXPRESSED IN THE NARRATIVE DESCRIPTION OF THE KSC RADIATION PROTECTION PROGRAM AS SUBMITTED IN OUR APPLICATION AND PARTICULARLY AS DESCRIBED IN THE ATTACHED DOCUMENTATION, ESPECIALLY KHB 1860.1. SUCH CONTRACTORS ARE ALSO OBLIGED TO MAINTAIN RADIOACTIVE MATERIAL LICENSES AND RADIATION MACHINE REGISTRATIONS IN THE PERFORMANCE OF THEIR DUTIES, AS IS THE HEALTH PHYSICS SERVICES CONTRACTOR. THE HEALTH PHYSICS CONTRACTOR, TOGETHER WITH ALL OTHER KSC CONTRACTORS AND GOVERNMENT EMPLOYEES, ARE THUSLY INVOLVED IN THE KSC RADIATION PROTECTION PROGRAM WHICH IS ULTIMATELY SUPPORTIVE TO THE OVERALL NASA/KSC MISSION-ORIENTED PROGRAM. THIS WILL SHORTLY BECOME EVEN MORE COMPLEX WHEN SHUTTLE BEGINS FLYING PAYLOADS DERIVED LITERALLY FROM THE SCIENTIFIC COMMUNITY OF THE WORLD AT LARGE; MANY PAYLOADS WILL INCLUDE RADIOACTIVE MATERIALS. IT IS PRECISELY THIS AWKWARD SYSTEM OF MULTI-LICENSURE, WHICH WOULD BE BEST

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CONTROLLED BY ONE RADIATION PROTECTION PROGRAM AT KSC/CCAFS AND ITS TEMPORARY JOB SITES, AND WHICH BEHOOVES NASA/KSC TO PURSUE A SINGULAR, CENTRALIZED NRC LICENSURE.

THE FOLLOWING INFORMATION RELATIVE TO PARAGRAPH 4 IS PROVIDED BY TAKING A MORE SPECIFIC, POINT-BY-POINT APPROACH. IF, IN SENTENCE NUMBER ONE TO PARAGRAPH 4, THE REFERENCE TO "CONTRACTOR INVOLVEMENT" WAS MEANT TO REFER TO PAN AMERICAN WORLD AIRWAYS (OMEHS), THE CONTRACTOR RESPONSIBLE FOR HEALTH PHYSICS IMPLEMENTATION OF THE RADIATION PROTECTION PROGRAM FOR KSC (AS STATED ABOVE), INFORMATION SUPPLIED TO YOU IN THE APPLICATION IS CONSIDERED TO BE SELF-EXPLANATORY REGARDING THAT CONTRACTOR'S INVOLVEMENT. IF YOU HAVE SPECIFIC QUESTIONS REGARDING THE HEALTH PHYSICS CONTRACTOR, PLEASE IDENTIFY. IF, HOWEVER, YOUR REFERENCE TO "CONTRACTOR INVOLVEMENT" RELATES TO ALL CONTRACTORS UTILIZING KSC CONTROLLED RADIOACTIVE MATERIALS WHILE PERFORMING WORK FOR NASA IN THE OVERALL KSC MISSION PROGRAM, WE HAVE DIFFICULTY COMPREHENDING THE BASIS OF YOUR CONCERN. GOVERNMENT AGENCIES ROUTINELY RETAIN CONTRACTORS TO PERFORM SERVICES FOR A PARTICULAR PROGRAM OF THE AGENCY. THE CONTRACTOR ORGANIZATIONS PERFORM THE CONTRACTED SERVICES UNDER THE MANAGEMENT, ADMINISTRATION, AND CONTROL OF THE AGENCY. NASA/KSC OPERATES IN THIS COMMONLY ACCEPTED MANNER. ALL USERS, NASA, DOD AND GOVERNMENT EMPLOYEES, AS WELL AS ALL CONTRACTORS, SUBCONTRACTORS, ETC., MUST COMPLY WITH THE CONTROLS AND REQUIREMENTS OF THE KSC RADIATION PROTECTION PROGRAM. ALSO, IN THE FIRST SENTENCE OF PARAGRAPH 4 YOUR REFERENCE TO OUR "PROGRAM" DID NOT SPECIFY IF YOU WERE REFERRING TO THE OVERALL KSC MISSION PROGRAM OR TO THE RADIATION PROTECTION PROGRAM. FOR THE PURPOSE OF OUR FURTHER RESPONSE TO THIS SEGMENT OF YOUR LETTER, WE WILL ASSUME THE REFERENCE IS TO THE LATTER.

UNDER THAT ASSUMPTION, CONCERNS REGARDING YOUR REFERENCE TO "LICENSES HELD BY CONTRACTORS," AGAIN IN SENTENCE ONE, WERE NOT UNDERSTANDABLE. SPECIFIC REFERENCE WAS MADE IN OUR APPLICATION TO THE HEALTH PHYSICS CONTRACTOR AND THE SPECIFIC U.S. NRC BYPRODUCT MATERIAL/SNM LICENSES ISSUED TO THAT CONTRACTOR BY THE NRC. THOSE LICENSES AUTHORIZE THE POSSESSION AND USE OF RADIOACTIVE MATERIALS BY THE HEALTH PHYSICS CONTRACTOR FOR THE BENEFIT OF NASA/KSC. UNDER THE PRESENT SYSTEM AT KSC WHEREBY CONTRACTORS AND OTHER GOVERNMENT AGENCIES OPERATE UNDER THEIR OWN LICENSES (DUE TO KSC'S LACK OF A "BROAD" LICENSE), THE HEALTH PHYSICS CONTRACTOR IS REQUIRED TO MAINTAIN SUCH LICENSING IN ORDER TO SATISFY THEIR CONTRACTUAL OBLIGATION TO KSC, AS PREVIOUSLY INDICATED. THE RADIOACTIVE MATERIALS MAINTAINED BY THE HEALTH PHYSICS CONTRACTOR ARE NASA PROPERTY. UPON ISSUANCE OF A BROAD SCOPE LICENSE TO NASA/KSC, THE LICENSES CURRENTLY MAINTAINED BY THE HEALTH PHYSICS CONTRACTOR WOULD BE TERMINATED AND ALL AFFECTED RADIOACTIVE MATERIALS WOULD BE TRANSFERRED TO THE KSC LICENSE. THE REFERENCE IN THE APPLICATION TO THE LICENSES CURRENTLY ISSUED TO THE HEALTH PHYSICS CONTRACTOR

WAS INTENDED TO PROVIDE YOU WITH INFORMATION CONCERNING THE CONTRACTOR VIA INFORMATION PREVIOUSLY SUBMITTED TO AND APPROVED BY THE NRC.

IN SUMMARY, RELATIVE TO THE HEALTH PHYSICS CONTRACTOR PROVIDING SUCH SERVICES TO NASA/KSC, WE FEEL THIS CONCEPT IS TOTALLY ACCEPTABLE AND IS NOT UNLIKE LICENSEES WHO RETAIN HEALTH PHYSICS CONSULTANT FIRMS FOR SIMILAR SERVICES.

WITH REGARDS TO THE SECOND AND THIRD SENTENCES OF PARAGRAPH 4 IN YOUR LETTER, IT WOULD APPEAR THAT YOU HAVE NOT BEEN ABLE TO APPRECIATE THE UNIQUE ASPECTS OF OUR RADIATION PROTECTION PROGRAM AND ITS IMPLEMENTATION FROM THE INFORMATION SUPPLIED IN THE APPLICATION. IT IS ANTICIPATED THAT IF YOU REVIEW THE DOCUMENTATION SUBMITTED, I.E., KMI'S/ KHB'S IN CONTEXT WITH THE APPLICATION, AS REQUESTED ABOVE RELATIVE TO PARAGRAPH 2, YOU WILL HAVE A BETTER UNDERSTANDING OF THE KSC RADIATION PROTECTION PROGRAM. IT IS ALSO ANTICIPATED THAT UPON COMPLETION OF SUCH A COMPREHENSIVE REVIEW OF THE APPLICATION, YOU WILL REALIZE THAT THE APPLICATION WAS DEVELOPED WITH FULL RELIANCE UPON REGULATORY GUIDE 10.5 AS REFERENCED IN YOUR LETTER.

RESPONSE TO PARA. 5

WE INTERPRET THIS PARAGRAPH TO BE REQUESTING MORE DETAIL REGARDING RADIATION PROTECTION TRAINING SPECIFICALLY PROVIDED BY NASA/KSC RESOURCES. IT SHOULD BE NOTED, HOWEVER, THAT THE OVERALL REVIEW, EVALUATION, AND APPROVAL PROCESS DESCRIBED IN DETAIL THROUGHOUT THE ORIGINAL APPLICATION ENCOMPASSES ALL ELEMENTS OF AN INDIVIDUAL'S TRAINING, EXPERIENCE, QUALIFICATIONS, AND CERTIFICATION, AND IS NOT CONFINED TO ONLY THAT OBTAINED BY THE INDIVIDUAL THROUGH NASA/KSC TRAINING PROGRAMS.

AS YOU CAN WELL IMAGINE, AN ORGANIZATION AS LARGE AND COMPLEX AS THE NASA/KSC DOES HAVE A FORMAL, STANDARDIZED TRAINING PROGRAM. THIS PROGRAM IS ADMINISTERED BY THE SYSTEMS TRAINING AND EMPLOYEE DEVELOPMENT BRANCH (AD-PER-2) OF THE PERSONNEL OFFICE WHICH IS PART OF THE ADMINISTRATIVE OPERATIONS AND SUPPORT SERVICES DIRECTORATE (AM). THE KSC SYSTEMS TRAINING PROGRAM OFFERS NUMEROUS COURSES IN THE AREAS OF OCCUPATIONAL SAFETY AND HEALTH, INCLUDING SEVERAL WHICH ARE DIRECTLY RELATED TO RADIOLOGICAL HEALTH. THE LIST OF COURSES OFFERED IS PERIODICALLY UPDATED TO ENSURE APPLICABILITY TO PLANNED OR ONGOING LAUNCH PROGRAMS AND OTHER PROJECTS.

PARA. 5-1

ATTACHMENT NO. 1 PROVIDES COPIES OF RADIOLOGICAL HEALTH COURSE OUTLINES THAT ARE AND HAVE BEEN PROVIDED UNDER THE KSC SYSTEMS TRAINING PROGRAM. THESE OUTLINES PROVIDE THE TOPICS COVERED AND TIME DEVOTED TO EACH (LEFT COLUMN). THE CONTENTS OF THESE COURSES ARE ALSO PERIODICALLY MODIFIED TO CONFORM TO CHANGING PROCEDURES, EQUIPMENT, REGULATIONS, ETC.

PARA. 5-2

THE SCOPE AND EXTENT OF ON-THE-JOB TRAINING (OJT) PROVIDED BY AND AT NASA/KSC NECESSARILY VARIES OVER A WIDE RANGE DEPENDING ON THOSE PARAMETERS DISCUSSED IN THE SUPPLEMENT TO ITEM 8 OF THE APPLICATION. IN ORDER TO MAINTAIN SUFFICIENT AUTHORITY AND FLEXIBILITY, THE DEGREE OF OJT REQUIRED FOR A PARTICULAR INDIVIDUAL AND FUNCTION IS ASSESSED ON A CASE-BY-CASE BASIS BY THE KSC/RPO, THE KSC RADIATION PROTECTION COMMITTEE, AND THE HEALTH PHYSICS CONTRACTOR, AND IS NOT TIED TO A SPECIFIC SCHEDULE OF REQUIREMENTS BEYOND THE MINIMUM REQUIREMENTS SET FORTH IN SECTION 2.6 OF THE KHB 1860.1. FOR EXAMPLE, A NOVICE INVOLVED IN THE MAINTENANCE OF SMOKE DETECTORS CONTAINING SEVERAL MICROCURIES OF RADIUM-226 MAY BE REQUIRED TO RECEIVE A ONE-HOUR ORIENTATION/INSTRUCTION BY AN APPROVED RADIATION USER, WHEREAS A CONTRACTOR HEALTH PHYSICS TECHNICIAN RESPONSIBLE FOR VARIOUS RADIATION PROTECTION FUNCTIONS (I.E., INSTRUMENT RESPONSE CHECKS USING 5 CI PUBE SOURCE) MAY REQUIRE THREE MONTHS OJT UNDER THE DIRECT SUPERVISION OF A PROFESSIONAL HEALTH PHYSICISTS BEFORE APPROVAL IS RECOMMENDED.

PARA. 5-3

AS WITH THE DEGREE OF OJT REQUIRED, AN INDIVIDUAL'S COMPETENCY IN PERFORMING A PARTICULAR FUNCTION IS DETERMINED ON A CASE-BY-CASE BASIS USING A COMBINATION OF CRITERIA DURING BOTH THE INITIAL REVIEW/APPROVAL CYCLE AND THROUGH SUBSEQUENT AUDITING. IN SOME CASES CERTIFICATION OF TRAINING/INSTRUCTION COURSE ATTENDANCE AND FAMILIARITY WITH APPLICABLE REGULATIONS AND CONTROL DOCUMENTS IS SUFFICIENT. IN OTHER CASES, EVALUATION OF SPECIAL MONITORING REPORTS AND/OR PERIODIC ROUTINE AREA SURVEYS OF OPERATIONS AND FACILITIES ARE UTILIZED. IN ALL CASES, THE CONTINUAL AUTHORITY OF THE KSC RADIATION PROTECTION COMMITTEE AND RPO TO APPROVE/DISAPPROVE OF INDIVIDUALS, OPERATIONS, AND FACILITIES IS SUPERIMPOSED UPON THE DETERMINATION OF COMPETENCY INVOLVED.

PARA. 5-4

THE ESTABLISHED KSC SYSTEMS TRAINING COURSES EXHIBITED IN ATTACHMENT NO. 1 ARE CONDUCTED BY THE HEALTH PHYSICS CONTRACTOR WHO IS ALSO RESPONSIBLE FOR THEIR DEVELOPMENT. THEY ARE GIVEN BY AND UNDER THE DIRECT SUPERVISION OF PROFESSIONAL HEALTH PHYSICISTS WITH ASSISTANCE FROM QUALIFIED STAFF HEALTH PHYSICS TECHNICIANS WHERE AND WHEN APPROPRIATE. TRAINING AND EXPERIENCE SUMMARIES FOR THE CURRENT APPROVED HEALTH PHYSICS CONTRACTOR STAFF ARE PROVIDED FOR INFORMATION ONLY IN ATTACHMENT NO. 2 AND ARE NOT INTENDED TO BE INCORPORATED INTO THE LICENSE APPLICATION. THEY ARE, HOWEVER, TYPICAL OF THE QUALIFICATIONS REQUIRED FOR HEALTH PHYSICS CONTRACTOR POSITIONS.

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KSC SYSTEMS TRAINING PROGRAM

COURSE NO. OP326KSC
COURSE TITLE: Introduction to Radiation Protection
COURSE LENGTH: 4 Hours
CLASS CAPACITY: 25 Students

COURSE DESCRIPTION:

This course presents the fundamentals of Radiological health protection. It is designed for non-technical personnel.

COURSE OUTLINE:

- 1:00 I. Ionizing Radiation Orientation
- A. Types, Characteristics and Energy
 - B. Definition of Units
 - 1. Quantity
 - 2. Activity
 - 3. Half Life
 - 4. Dose
 - 5. Dose Rate
 - C. Field Instrumentation
 - 1. Types and Uses
 - 2. Demonstration
- 1:00 II. Biological Considerations
- A. Short Term Effects
 - B. Long Term Effects
- 1:00 III. Exposure Controls
- A. Routine

COURSE NO. OP326KSC (Continued)

1. Personnel
2. Use Areas

B. Emergency

1. Contaminated Areas
2. Airborne Contamination

C. Exposure Limitations

0:30 IV. Control Documents and Guidelines

- A. AEC
- B. State
- C. OSHA
- D. KSC
- E. Air Force

0:15 V. Mandatory Posting Requirements

0:15 VI. Organization

- A. KSC
- B. CKAFS

SYSTEMS TRAINING PROGRAM

COURSE NO: OP-324 KSC
COURSE TITLE: Radiation Protection for Emergency Workers
COURSE LENGTH: 3 Hours
CLASS CAPACITY: 25 Students
COURSE DESCRIPTION:

This course is designed to provide indoctrination and/or refresher training for students in the fundamentals of radiological health protection, and in the control of radiation hazards during emergency response actions.

COURSE OUTLINE:

- I. Introduction
 - 0:10 A. Purpose
 - B. Course description
 - C. Classroom discipline
- II. Radiation in Perspective
 - 0:50
- III. Typical Hazards
 - 0:35 A. General use/storage areas
 - B. Launch pad
- IV. Radiation/Contamination Control
 - 0:50 A. Personnel protection
 - B. Case handling/rescue
 - C. Personnel monitoring and decontamination
 - D. Health physics support/response in emergencies
- V. Summary
 - 0:15

KSC SYSTEMS TRAINING PROGRAM

COURSE NO: OPI05KSC

COURSE TITLE: Major Radioactive Source (MRS/RTG) Orientation

COURSE LENGTH: 2 Hours

CLASS CAPACITY: 25 Students

COURSE DESCRIPTION:

This course provides a basic and practical understanding of the radiological hazards, regulations, and safety aspects associated with MRS (RTG) operations.

COURSE OUTLINE:

0:05 I. Introduction

- A. Purpose of Course
- B. Description of Course

0:65 II: Review of Radiation Basics

- A. Nuclear, Atomic, and Molecular Structure
- B. Types of Ionizing Radiation
- C. Definition of Radiation Units
- D. Film, "Radiation in Perspective"

0:15 III: Biological Effects of Ionizing Radiation

- A. General Information
- B. Factors Which Determine Extent of Damage
- C. Short-Term Effects of Acute Exposure
- D. Long-Term Effects of Low/Moderate Exposures
- E. Natural Background Levels

0:10 IV. Exposure Controls

- A. Exposure Limits
- B. Regulations

COURSE NO: OPI05KSC (Continued)

0:15 V. MRS (RTG) Hazards and Precautions

- A. Description of Radiation Hazards
- B. Exposure Controls and Safety Precautions
- C. Emergency Procedures

KSC SYSTEMS TRAINING PROGRAM

COURSE NO: OP104KSC
COURSE TITLE: Introduction to Neutron Radiation
COURSE LENGTH: 2 Hours
CLASS CAPACITY: 25 Students

COURSE DESCRIPTION:

This course provides the theoretical and practical fundamentals regarding neutron radiation. It is primarily intended for training personnel involved in neutron radiography operations.

COURSE OUTLINE:

- 0:10 I. Introduction
- A. Purpose
 - B. Course Description
- 0:35 II: Review of Radiation Theory
- A. Nuclear, Atomic, and Molecular Structure
 - B. Ionization
 - C. Types of Ionizing Radiation
 - D. Radiation Units
- 0:20 III: Interaction of Neutron Radiation with Matter
- A. Classification by Energy
 - B. Types of Interaction
- 0:20 IV: Biological Effects of Neutron Radiation
- A. External Hazard
 - B. Fast and Relativistic Neutrons
 - C. Intermediate and Thermal Neutrons
 - D. General Comments

COURSE NO. OP104KSC (Continued)

0:20 V. Basic Protection Against Neutron Radiation

- A. General Rules and Regulations
- B. Shielding
- C. Major Characteristics

0:15 IV. Neutron Detector Familiarization