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MEMORANDUM FOR: Raymond F. Fraley, Executive Director
Advisory Committee on Nuclear Waste
and Reactor Safeguards

THRU: Abraham L. Eiss, ACNW Liaison
Special Issues Group
Office of Nuclear Material Safety
and Safeguards

FROM: B. J. Youngblood, Director
Division of High-Level Waste Management
Office of Nuclear Material Safety
and Safeguards

SUBJECT: TRANSMITTAL OF DRAFT PROPOSAL RULEMAKING, "DISPOSAL OF HIGH-LEVEL RADIOACTIVE WASTES IN GEOLOGIC REPOSITORIES--DESIGN BASIS EVENTS FOR THE GEOLOGIC REPOSITORY OPERATIONS AREA."

Five copies of the subject draft rulemaking are enclosed for the Advisory Committee on Nuclear Waste (ACNW), in accordance with the Memorandum of Understanding between the ACNW and the Executive Director for Operations. Additional material, as may be useful to the ACNW Committee members, will be provided within the next two weeks. A briefing to the ACNW on this subject is scheduled for May 29, 1992.

If you require additional information about this draft rulemaking, please contact the responsible staff member, Mysore Nataraja, at extension 504-3459 or Philip Altomare, at extension 504-3400.

/s/

B. J. Youngblood, Director
Division of High-Level Waste Management
Office of Nuclear Material Safety
and Safeguards

See previous concurrence

Enclosure: As stated

DISTRIBUTION

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ACNW	NMSS R/F	LPD R/F	Central File
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STreby, OGC	AEiss, PMSI	On-Site Reps	

OFC	:HLPD	:HLPD	:HLHP	:HLHP	:HLHP	:HLWM
NAME	:PAltomare/jh	:JHolonich	:MNataraja	:RBallard	:MFederline	:JLinehan
Date	:05/ /92	:05/20/92	:05/ /92	:05/ /92	:05/ /92	:05/21/92
OFC	:HLWM	:OGC	:PMSI	:	:	:
NAME	:JYoungblood	:STreby	:AEiss	:	:	:
Date	:05/21/92	:05/21/92	:05/21/92	:	:	:

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THRU: Abraham L. Eiss, ACNW Liaison
Special Issues Group
Office of Nuclear Material Safety
and Safeguards

FROM: B. J. Youngblood, Director
Division of High-Level Waste Management
Office of Nuclear Material Safety
and Safeguards

SUBJECT: TRANSMITTAL OF BRIEFING CHARTS FOR PROPOSED RULEMAKING, "DISPOSAL OF HIGH-LEVEL RADIOACTIVE WASTES IN GEOLOGIC REPOSITORIES--DESIGN BASIS EVENTS FOR THE GEOLOGIC REPOSITORY OPERATIONS AREA."

Five copies of the subject rulemaking briefing charts are enclosed for the Advisory Committee on Nuclear Waste (ACNW). This briefing is scheduled for May 28, 1992, 10:15 AM to 12:15 PM.

If you have questions or require additional information, please contact the responsible staff member, Mysore Nataraja, at extension 504-3459 or Philip Altomare, at extension 504-3400.

B. J. Youngblood, Director
Division of High-Level Waste Management
Office of Nuclear Material Safety
and Safeguards

Enclosure: As stated

DISTRIBUTION

NMSS R/F	HLPD R/F	Central File	BJYoungblood,HLWM	
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OFC	:HLPD	:HLPD	:HLHP	:HLHP	:HLHP	:HLWM
NAME	:PAltomare/jh	:JHolonich	:MNataraja	:RBallard	:MFederline	:JLinehan
Date	:05/20/92	:04/ /92	:05/20/92	:05/21/92	:04/21/92	:04/ /92

OFC	:HLWM:	:OGC	:PMSI	:	:	:
NAME	:JYoungblood	:STreby	:AEiss	:	:	:
Date	:04/ /92	:04/ /92	:04/ /92	:	:	:

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BRIEFING TO ADVISORY COMMITTEE ON NUCLEAR WASTE

PROPOSED RULEMAKING 10 CFR PART 60

DESIGN BASIS EVENTS FOR THE GEOLOGIC REPOSITORY OPERATIONS AREA

MAY 28, 1992

BRIEFING OUTLINE

- INTRODUCTORY REMARKS
- BACKGROUND
- PROPOSED RULE
- SUMMARY

INTRODUCTORY REMARKS

- EARLY PROBLEM RECOGNITION
- DOE PETITION FOR RULEMAKING
- RULEMAKING OBJECTIVE

BACKGROUND

- EARLY CONSIDERATIONS
- DOE PETITION
- FEDERAL REGISTER NOTICE

EARLY CONSIDERATIONS

PART 60 INCONSISTENT WITH PART 72

- ABSENCE OF PRECLOSURE "CONTROLLED AREA" AND REFERENCE DOSE SIMILAR TO THAT IN 10 CFR PART 72

- DIFFERENT PHILOSOPHY FOR THE DEFINITION OF ITEMS IMPORTANT TO SAFETY:

  - PART 60 DEFINITION BASED UPON 0.5 REM (5 mSv) AT UNRESTRICTED AREA BOUNDARY

  - PART 72 CONTAINS FUNCTIONAL DEFINITION (i.e., ITEMS THAT HANDLE AND STORE HIGH-LEVEL WASTE)

DOE PETITION

- **RECOMMENDED QUANTITATIVE ACCIDENT DOSE CRITERIA OF 5 REM (0.05 Sv) FOR THE CONTROLLED AREA**

- **TO ACCOMPLISH THE DESIRED AMENDMENT, DOE PROPOSED TO:**

  - ELIMINATE THE PHRASE "AT ALL TIMES" IN REFERENCE TO 10 CFR PART 20

  - ESTABLISH A PRECLOSURE CONTROLLED AREA

  - ESTABLISH A BOUNDARY DOSE LIMIT OF 5 REM (0.05 Sv) AT THE CONTROLLED AREA

  - MODIFY DEFINITION OF IMPORTANT TO SAFETY TO REFER TO CONTROLLED AREA RATHER THAN RESTRICTED AREA

  - IF ACCIDENT DOSE LESS THAN 5 REM (0.05 Sv) AT CONTROLLED AREA BOUNDARY, NO MITIGATION REQUIRED

JULY 13, 1990
FEDERAL REGISTER
NOTICE

- o STATED DOE'S PETITION

- o IDENTIFIED NRC'S RELATED REGULATORY INITIATIVE

- o IDENTIFIED STAFF CONCERNS
  - POTENTIALLY INEFFECTIVE SAFETY DESIGN AND QA MEASURES
  - POTENTIALLY INADEQUATE RADIOLOGICAL PROTECTION FOR WORKERS

- o REQUESTED COMMENTS ON
  - DOE PETITION
  - NRC'S APPROACH

- o DOE COMMENTED

PROPOSED RULE

- **DEFINITIONS**
- **DESIGN REQUIREMENTS**
- **RADIOLOGICAL PROTECTION**
- **SUMMARY**

DEFINITIONS "IMPORTANT TO SAFETY"

o CURRENT RULE

- DEFINITION LACKS A FIRM REGULATORY BASIS
- CAN BE RENDERED INEFFECTIVE BY EXTENDING THE UNRESTRICTED AREA BOUNDARY
- FAILS TO ADDRESS WORKER SAFETY
- HAS POTENTIAL FOR RELAXING SAFETY AND QA REQUIREMENTS

o PROPOSED RULE

- ADOPTS PART 72 DEFINITION
- ELIMINATES REFERENCE TO DOSE
- ASSURES WORKER SAFETY AND QA

PROPOSED DEFINITION OF IMPORTANT TO SAFETY (FROM 10 CFR PART 72)

"IMPORTANT TO SAFETY" MEANS IMPORTANT:

(1) TO MAINTAIN THE CONDITIONS REQUIRED TO STORE HLW SAFELY.

(2) TO PREVENT DAMAGE TO SPENT FUEL, OR ANY HLW CONTAINER DURING HANDLING OR STORAGE.

(3) TO PROVIDE REASONABLE ASSURANCE THAT HLW CAN BE RECEIVED, HANDLED, PACKAGED, STORED, AND RETRIEVED WITHOUT UNDUE RISK TO THE HEALTH AND SAFETY OF THE PUBLIC.

DEFINITIONS "DESIGN BASES"

o CURRENT RULE

- THE PHRASE APPEARS IN 60.21 (c) (2) AND OTHERS
- BUT NOT DEFINED ANYWHERE

o PROPOSED RULE

- ADOPTS PART 72 DEFINITION
- SOC EXPLAINS AND DISCUSSES DETAILS

  IDENTIFY STRUCTURES, SYSTEMS, AND COMPONENTS (SSC)

  IDENTIFY FUNCTIONS ASSOCIATED WITH SSC

  DEFINE CONDITIONS UNDER WHICH FUNCTIONS MUST BE MAINTAINED

* SOC = STATEMENT OF CONSIDERATIONS

PROPOSED DEFINITION OF **DESIGN BASES** (FROM 10 CFR PART 72)

"**DESIGN BASES**" MEANS THAT INFORMATION THAT IDENTIFIES THE SPECIFIC FUNCTIONS TO BE PERFORMED BY A STRUCTURE, SYSTEM, OR COMPONENT OF A FACILITY AND THE SPECIFIC VALUES OR RANGES OF VALUES CHOSEN FOR CONTROLLING PARAMETERS AS REFERENCE BOUNDS FOR DESIGN. THESE VALUES MAY BE RESTRAINTS DERIVED FROM GENERALLY ACCEPTED "STATE-OF-THE-ART" PRACTICES FOR ACHIEVING FUNCTIONAL GOALS OR REQUIREMENTS DERIVED FROM ANALYSIS (BASED ON CALCULATION OR EXPERIMENTS) OF THE EFFECTS OF A POSTULATED EVENT UNDER WHICH A STRUCTURE, SYSTEM, OR COMPONENT MUST MEET ITS FUNCTIONAL GOALS. THE VALUES FOR CONTROLLING PARAMETERS FOR EXTERNAL EVENTS INCLUDE: (1) ESTIMATES OF SEVERE NATURAL EVENTS TO BE USED FOR DERIVING DESIGN BASES THAT WILL BE BASED ON CONSIDERATION OF HISTORICAL DATA ON THE ASSOCIATED PARAMETERS, PHYSICAL DATA, OR ANALYSIS OF UPPER LIMITS OF THE PHYSICAL PROCESSES INVOLVED; AND (2) ESTIMATES OF SEVERE EXTERNAL MAN-INDUCED EVENTS, TO BE USED FOR DERIVING DESIGN BASES, THAT WILL BE BASED ON ANALYSIS OF HUMAN ACTIVITY IN THE REGION TAKING INTO ACCOUNT THE SITE CHARACTERISTICS AND THE RISKS ASSOCIATED WITH THE EVENT.

DEFINITIONS "CONTROLLED-USE AREA"

- **CURRENT RULE**
  - ABSENT
- **PROPOSED RULE**
  - PROVIDES A DEFINITION
  - CONTROLS PUBLIC ACCESS WITHIN THE BOUNDARY

PROPOSED DEFINITION OF CONTROLLED-USE AREA

"CONTROLLED-USE AREA" MEANS THAT SURFACE AREA IMMEDIATELY SURROUNDING THE GEOLOGIC REPOSITORY OPERATIONS AREA FOR WHICH THE LICENSEE EXERCISES AUTHORITY OVER ITS USE, IN ACCORDANCE WITH THE PROVISIONS OF THIS PART, UNTIL PERMANENT CLOSURE HAS BEEN COMPLETED.

DESIGN REQUIREMENTS

o CURRENT RULE

- SUFFICIENTLY CLEAR FOR "NORMAL OPERATIONS"
- UNCLEAR FOR "ACCIDENT CONDITIONS"

o PROPOSED RULE

- SOC DISCUSSES FOUR CLASSES OF DESIGN EVENTS (ANSI/ANS-57.9)
- SOC DISTINGUISHES DESIGN REQUIREMENTS FOR SSCIS
- RULE ENCOMPASSES ALL FOUR CLASSES OF DESIGN EVENTS
- RULE REPLACES "NORMAL CONDITIONS" AND "ACCIDENT CONDITIONS" WITH "DESIGN BASIS EVENTS"
- RULE SPECIFIC ON PREVENTING/MITIGATING ACCIDENTS
- GUIDANCE TO BE PROVIDED FOR IMPLEMENTATION

*SSCIS = STRUCTURES, SYSTEMS, AND COMPONENTS IMPORTANT TO SAFETY

DESIGN BASIS EVENTS (FROM ANSI/ANS-57.9)

DESIGN EVENT I - EXPECTED TO OCCUR REGULARLY OR FREQUENTLY

DESIGN EVENT II - EXPECTED TO OCCUR ONCE DURING A CALENDAR YEAR

DESIGN EVENT III - EXPECTED TO OCCUR DURING THE LIFETIME OF THE FACILITY

DESIGN EVENT IV - CREDIBLE BUT UNLIKELY

KEY SUPPLEMENTARY SAFETY FUNCTION (131 (b) (11))

"THE STRUCTURES, SYSTEMS, AND COMPONENTS IMPORTANT TO SAFETY SHALL BE DESIGNED SO AS TO PREVENT OR MITIGATE ANY DAMAGE TO SPENT FUEL, OR ANY HIGH-LEVEL RADIOACTIVE WASTE CONTAINER, IF ANY OF THE DESIGN BASIS EVENTS SHOULD OCCUR."

RADIATION PROTECTION

o CURRENT RULE

- UNCLEAR FOR "ACCIDENT CONDITIONS"

o PROPOSED RULE

- SOC EXPLAINS PART 20 LIMITS APPLY TO CLASS I, II, AND III EVENTS

- PUBLIC PROTECTED BY 5 REM (0.05 Sv) REFERENCE DOSE ON OR BEYOND THE CUA BOUNDARY

*CUA = CONTROLLED-USE AREA

CONTROLLED-USE BOUNDARY REFERENCE DOSE

- 5 REM (0.05 Sv) TOTAL EFFECTIVE DOSE EQUIVALENT

- 50 REM (0.50 Sv) COMMITTED DOSE EQUIVALENT TO ANY ORGAN

- 15 REM (O.15 Sv) EYE DOSE EQUIVALENT

- 50 REM (0.50 Sv) SKIN SHALLOW-DOSE EQUIVALENT

CURRENT IMPLEMENTATION OF DESIGN AND OPERATIONAL REQUIREMENTS AND RADIATION PROTECTION LIMITS FOR PART 72 LICENSED FACILITIES
(ALSO PROPOSED IMPLEMENTATION FOR PART 60 LICENSED FACILITIES)

CLASS*	DESIGN BASIS EVENTS	DESIGN AND OPERATIONAL REQUIREMENTS		RADIATION PROTECTION LIMITS	
		STRUCTURES, SYSTEMS COMP. IMP. TO SAFETY	STRUCTURES, SYSTEMS NOT IMP. TO SAFETY	PUBLIC	WORKERS
I	REGULAR EVENTS	DESIGN AND OPERATE TO MAINTAIN SAFE CONDITIONS	DESIGN AND OPERATE TO MAINTAIN SAFE CONDITIONS	PART 20 72.104(a) (40 CFR 191)	PART 20
II	EVENTS NOT REGULAR BUT EXPECTED TO OCCUR FREQUENTLY				
III	INFREQUENT BUT EXPECTED EVENTS				
IV	POSTULATED EVENTS CREDIBLE, BUT NOT EXPECTED	DESIGN TO PERFORM SAFETY FUNCTIONS	--	5 REMS AT THE CONTROLLED USE AREA BOUNDARY, EMERGENCY PLANS AND PROCEDURES	RECOGNIZE DOSE LIMITS COULD BE EXCEEDED - USE EMERGENCY PLANS AND PROCEDURES

*PER ANSI/ANS-57.9

SUMMARY

PROPOSED RULE:

- o IMPLEMENTS COMMISSION POLICY FOR RADIATION PROTECTION AND DEFENSE IN DEPTH PHILOSOPHY

- o STRIVES FOR CONSISTENCY WITH NRC REGULATIONS FOR SIMILAR FACILITY

- o RESPONDS TO DOE PETITION

  - INCLUDES CONTROLLED-USE AREA
  - INCLUDES CONTROLLED-USE AREA REFERENCE DOSE
  - (SEPARATES DOSE LIMIT FROM DEFINITION OF SSCIS)