

LICENSEE: Entergy Operations, Inc. (EOI)

August 25, 1995

FACILITY: Grand Gulf Nuclear Station

SUBJECT: SUMMARY OF MEETING ON JULY 20, 1995, REGARDING SYSTEMS REQUIRED WHILE HANDLING IRRADIATED FUEL IN CONTAINMENT

On July 20, 1995, representatives of EOI met with the NRC to clarify issues regarding containment systems operability relaxations during shutdown while handling irradiated fuel assemblies. This issue started with a request by Grand Gulf in November 1994 as a cost beneficial licensing action. The relaxations would be used first at Grand Gulf nuclear station, but also apply to three other BWR/6 plants: River Bend, Perry and Clinton (representatives of each were present). Meeting attendees are listed in Attachment 1. The licensee's handout is in Attachment 2.

EOI started the meeting by presenting their technical analysis results regarding fuel handling accidents (FHA). They stated that their analysis indicates that after sufficient decay the radiological consequences of the fuel handling accident are reduced to less than 25% of the Part 100 doses. They discussed their proposed changes to the technical specifications (TSs) as part of their presentation.

The staff discussed its concerns regarding shutdown risk, and EOI stated that shutdown risk concerns were not affected by the TS changes they were seeking because EOI's shutdown risk analysis demonstrates that loss of decay heat removal is important only during the first 5 1/2 days, which is not affected by the requested change of TS (after 12 days of decay).

EOI requested feedback on the issues in order to accelerate the process to meet their October 1995 goal. NRC indicated that internal discussions would be necessary before a final determination or further comments could be given.

ORIGINAL SIGNED BY:

Paul W. O'Connor, Senior Project Manager
Project Directorate IV-1
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Docket Nos. 50-313, 50-368, 50-458,
50-382 and 50-416

Attachments: 1. Meeting Attendees List
2. Licensee's Handout

cc w/atts: See next pages

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Document Name: GG91229.MTS

OFC	LA:PD4-1	I:PD4-1 <i>not in</i>	PM:PDIV-1 <i>not in</i>
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DATE	8/21/95	8/25/95	8/25/95
COPY	YES/NO	YES/NO	YES/NO

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DISTRIBUTION: Entergy Operations, INC. (EOI) MEETING SUMMARY

w/attachments 1 & 2

Docket Files

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DWigginton

KDesail (0-8E-23)

DPickett (0-13E-21)

CSchuliten (0-11E-21)

DCarter (0-11E-22)

CBerlinger (0-10D-4)

EWeiss (0-8E-23)

RJones (0-8E-23)

MVirgilio (0-8E-2)

BFerrel

ACRS (4)

JMitchell (17-G-21)

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880010

DFOI



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

August 25, 1995

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FACILITY: Grand Gulf Nuclear Station
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A handwritten signature in cursive script that reads "Paul W. O'Connor".

Paul W. O'Connor, Senior Project Manager
Project Directorate IV-1
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

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50-382 and 50-416

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cc w/atts: See next pages

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Grand Gulf Nuclear Station

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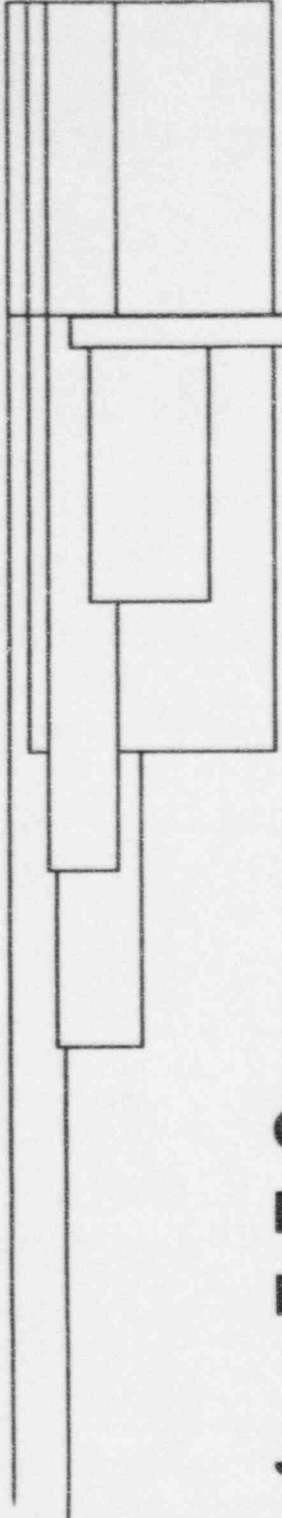
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LIST OF ATTENDEES

MEETING WITH ENERGY OPERATIONS, INC. REGARDING
SYSTEMS REQUIRED WHILE HANDLING IRRADIATED FUEL IN CONTAINMENT

July 20, 1995

<u>NAME</u>	<u>ORGANIZATION</u>
Paul O'Connor	NRC/NRR/DRPW/PD-IV-1
Mike Meisner	EOI
David Wigginton	NRC/NRR/DRPW/PD-IV-1
Barry Burmeister	EOI
Guy Davant	EOI
E. G. Adensam	NRC/NRR/DRPW
Kulin D. Desai	NRR/SRXB
Emilio Fuentes	NRR/DONRR
Douglas Pickett	NRR/DRPW/PD-III-3
Carl Schulten	NRR/OTSB
Paige Negres	GE
Daniel R. Carter	NRR/TERB
W. O. Long	NRC
Tom Elwood	Illinois Power/Clinton
Warren C. Lyon	NRR/SRXB
Greg Broadbent	EOI/GGNS
Bryan Ford	EOI/GGNS
Carl H. Berlinger	NRC/NRR/DSSA/SCSB
Eric Weiss	NRC/NRR/DSSA/SRXB
Robert C. Jones	NRC/NRR/DSSA/SRXB
Marty Virgilio	NRC/DSSA
Brad Ferrell	CEI



Containment Requirements to Mitigate Fuel Handling Accidents

**Centerior
Energy Operations
Illinois Power**

July 20, 1995

Agenda

- ◆ **Introduction** **Bryan Ford**
- ◆ **Analyses** **Greg Broadbent**
- ◆ **Technical Specifications** **Bryan Ford**
- ◆ **Shutdown Risk** **Bryan Ford**
- ◆ **Summary** **Bryan Ford**

Meeting Purpose

- ◆ **Discuss requirements for containment during fuel handling**
- ◆ **Discuss methodology for establishing technical specification limits**
- ◆ **Establish “generic” technical specification requirements**
- ◆ **Address potential effects of the proposed change on shutdown risk considerations**

GGNS Request

- ◆ **Technical Specification change request submitted November 9, 1994**
- ◆ **Submitted as a CBLA**
- ◆ **Expected to save over \$500K over the life of the plant**
- ◆ **NRC and the industry would like to make GGNS request as generic as possible to include the other BWR 6s and, ultimately, the remainder of the BWRs**

Project Status

- ◆ **Grand Gulf has submitted TS change - will amend based on generic agreements**
- ◆ **River Bend will submit July 1995 for January 1996 outage**
- ◆ **Perry considering submittal for January 1996 outage**
- ◆ **Clinton considering submittal for Fall 1996 outage**

GGNS FHA Analyses

General

- ◆ ICRP 30 dose conversion factors
- ◆ Current GGNS χ/Q parameters
- ◆ Instantaneous release (no holdup)
- ◆ Bounding radial peaking factors
- ◆ Maintain appropriate margins and design conservatisms

Source Terms

- ◆ **Generated from ORIGEN analyses for specific enrichment, burnup, and power level**
 - **considers decay and daughter products**
 - **transient source terms**
- ◆ **Increased scrubbing where >23 feet water coverage is available**

Release Fractions

- ◆ **This analysis applies**
 - **Reg Guide 1.25 release fractions**
 - **NUREG/CR-5009 I-131 release fraction (12%)**

- ◆ **Planning to apply in future**
 - **NUREG/CR-1465: advanced reactor source term work (GGNS in pilot plant program)**

Analysis Conservatism

- ◆ **All rods in dropped bundle assumed to fail in bending**
- ◆ **Struck rod failures were determined from worst-case drop scenario considering impact energy and rod failure threshold**
- ◆ **Total failures used to calculate dose consequences**
- ◆ **Weight of the fuel mast and grapple included in the analyzed dropped weight**

Analysis Summary

- ◆ **Following radioactive decay, ESF Systems are not required during a fuel handling accident to maintain calculated doses less than the regulatory guidance (e.g., 75 rem thyroid offsite and 30 rem thyroid control room)**
- ◆ **Amount of decay required is site specific (e.g., χ/Q)**
- ◆ **Amount of decay required can vary due to cycle specific parameters (e.g., burnup and peaking) and fuel type**
- ◆ **Advanced source term work expected to reduce calculated doses**



Technical Specification Requirements

Methodology

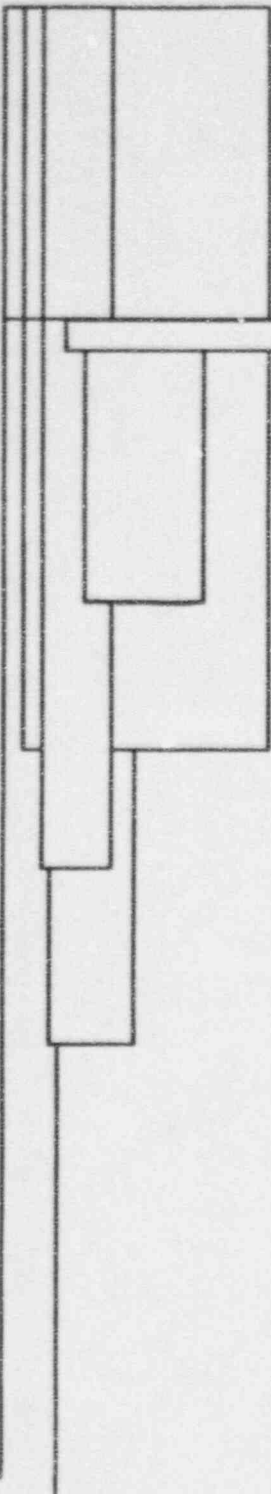
- ◆ **Following the guidance of the Final Policy Statement on TS Improvement, focus the TS requirements on those systems necessary to mitigate postulated events**
- ◆ **Recognize that the need for ESF systems to mitigate the postulated events during shutdown is time dependent**

Overview of Proposed Technical Specification

- ◆ **Retains the requirement for OPERABILITY of systems used to mitigate the dose consequences of an FHA during the time frame the analysis takes credit for their functioning**
- ◆ **Does not alter the TS requirements concerning operations with potential for draining the reactor vessel**
- ◆ **Does not alter the TS requirements for protection from criticality events**
- ◆ **Does not alter the TS requirements for decay heat removal and diesel generator OPERABILITY**

Details of Proposed Change

- ◆ **Requires dose mitigation systems to be OPERABLE when handling “recently irradiated fuel assemblies”**
- ◆ **Removes the requirement for dose mitigation systems to be OPERABLE during CORE ALTERATIONS**
- ◆ **Provides Bases discussions describing the relevant limit**

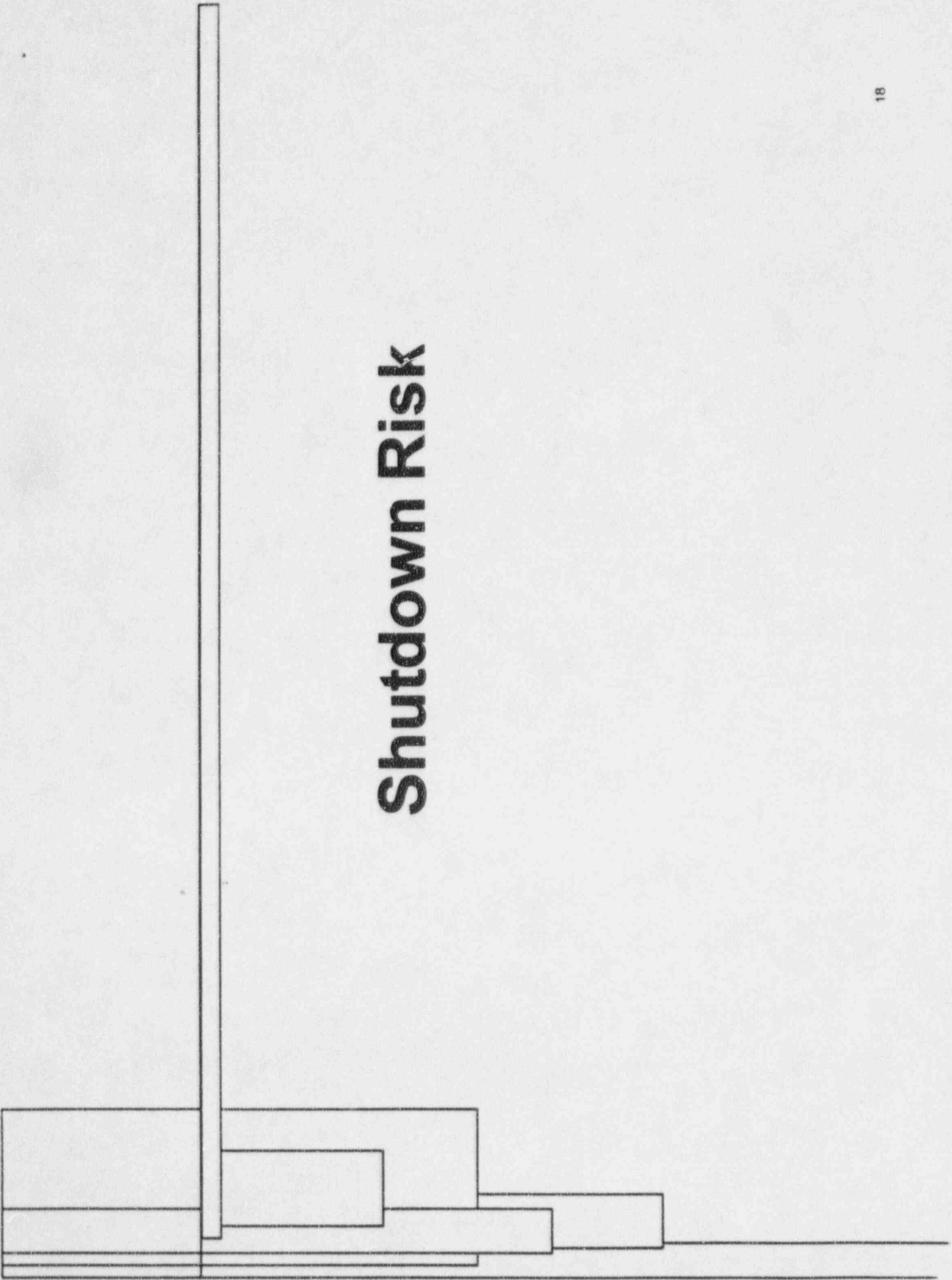


NUREG 1434 Technical Specification Changes

Technical Specification Change Summary

- ◆ **Following the guidance of the Final Policy Statement on TS Improvement, focuses the TS requirements on those systems necessary to mitigate postulated events**
- ◆ **Retains the requirement for OPERABILITY of systems used to mitigate the dose consequences of an FHA during the time frame the analysis takes credit for their functioning**

Shutdown Risk



BWR 6 Containments Credited During Shutdown



◆ Clinton	Secondary
◆ Grand Gulf	Secondary
◆ Perry	Primary
◆ River Bend	Primary

Current Containment Requirements

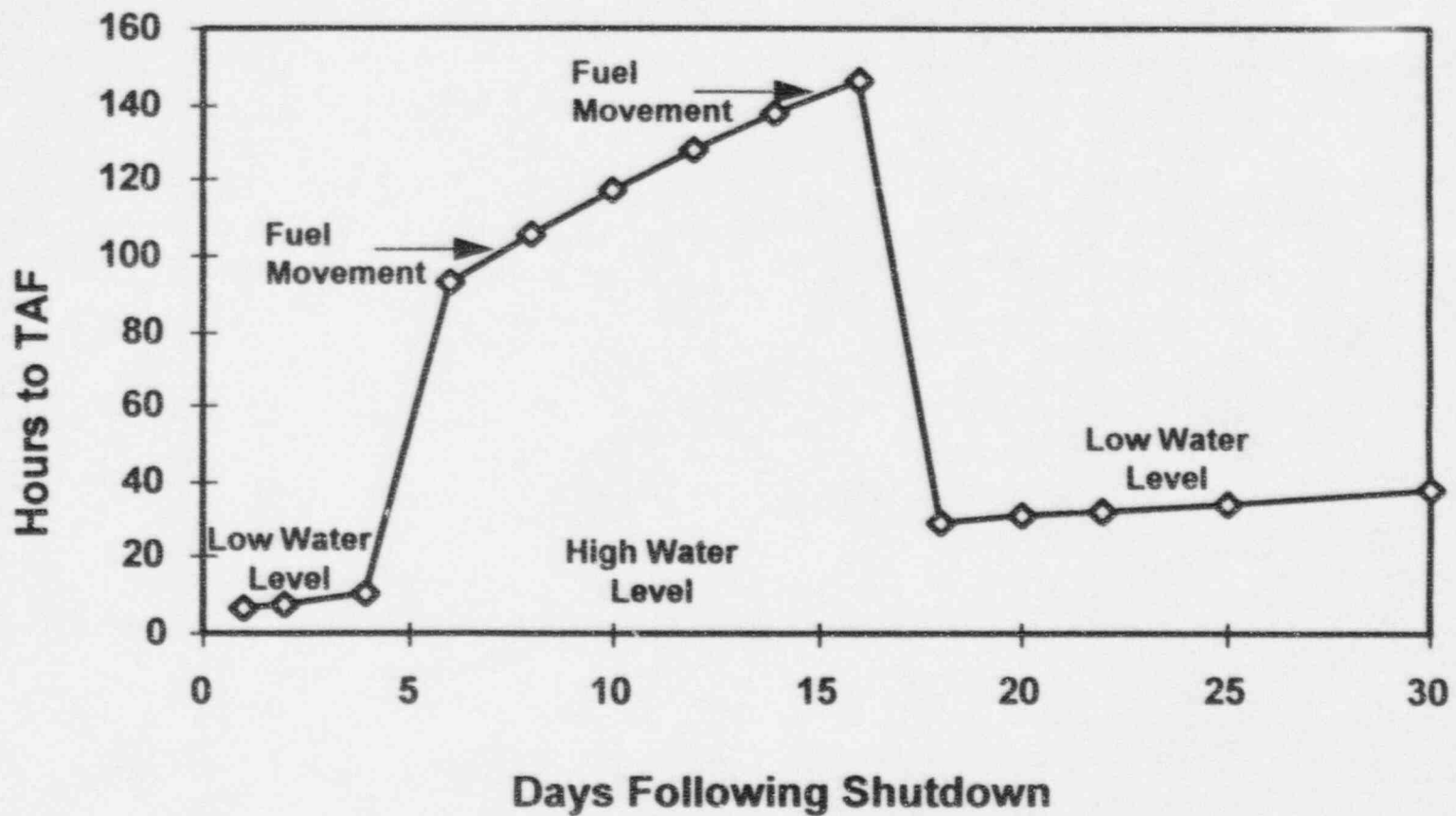
- ◆ **Containment is not currently required to be OPERABLE at all times in MODES 4 and 5**
- ◆ **Containment requirements are based on specific events (e.g., FHA, draindown) not shutdown risk (i.e., severe accidents) considerations**
- ◆ **Proposed change only reduces the amount of time containment will be required to be OPERABLE by TS, while meeting all license basis criteria and does not affect shutdown risk**

NUMARC 91-06

Guidelines For Industry Actions To Assess Shutdown Management

- ◆ **Section 4.5 discusses the need to assure that primary/secondary containment closure can be achieved to prevent fission product release during severe accidents**
- ◆ **Identifies that the time to effect closure should be consistent with plant conditions (e.g., RCS inventory and decay heat load)**
- ◆ **All BWR 6's have administrative controls in place to meet the recommendations of NUMARC 91-06**

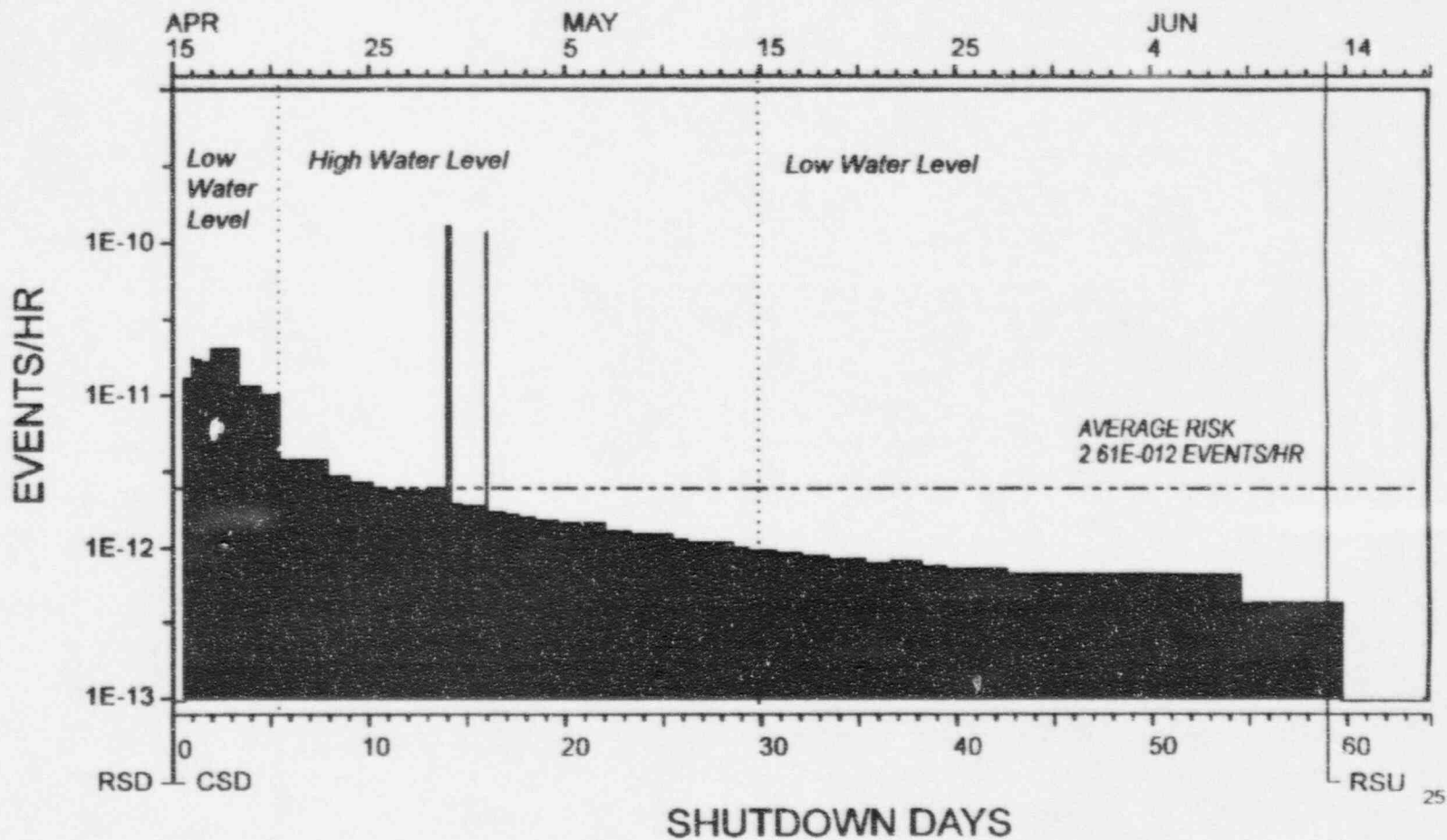
Time to Top of Active Fuel



GGNS RFO7

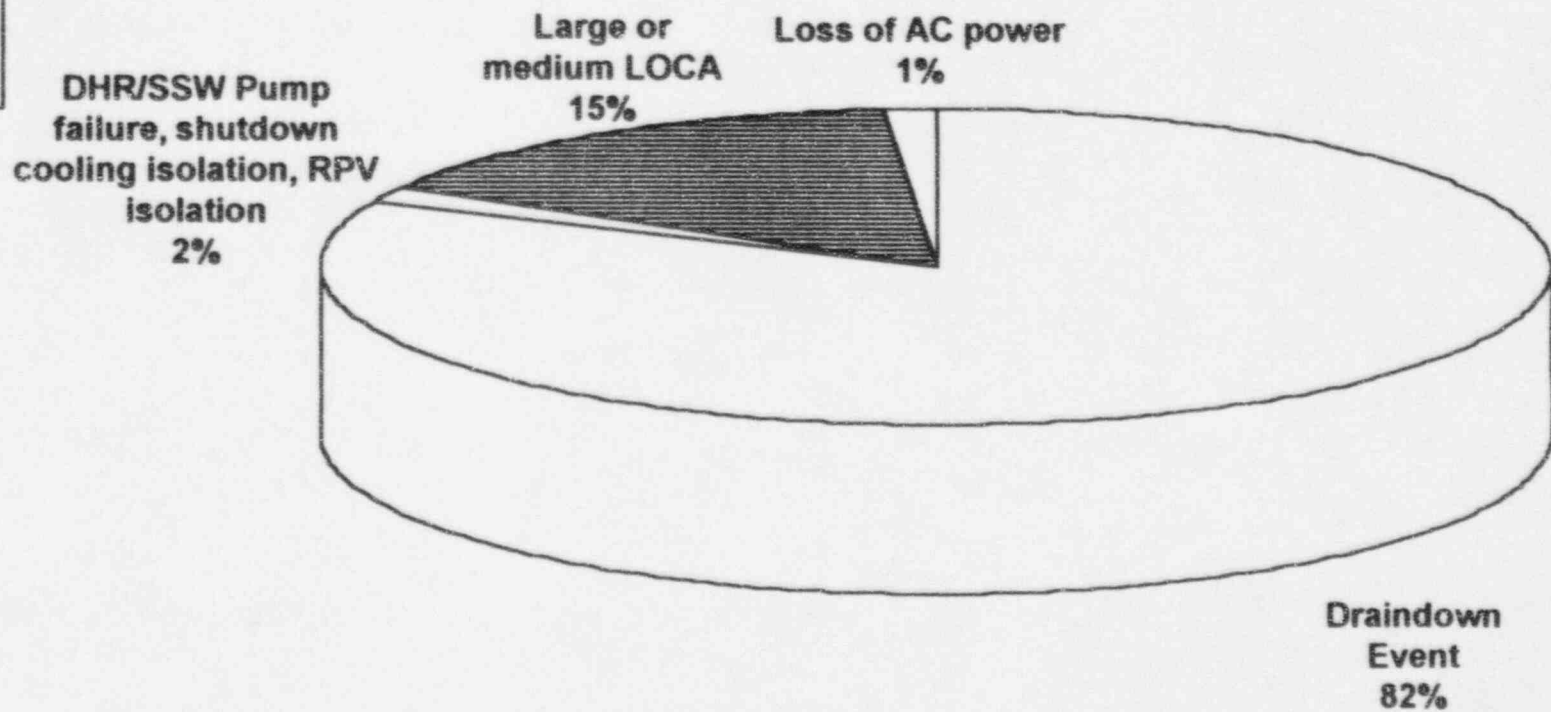
Core Damage Risk Profile

CORE DAMAGE RISK

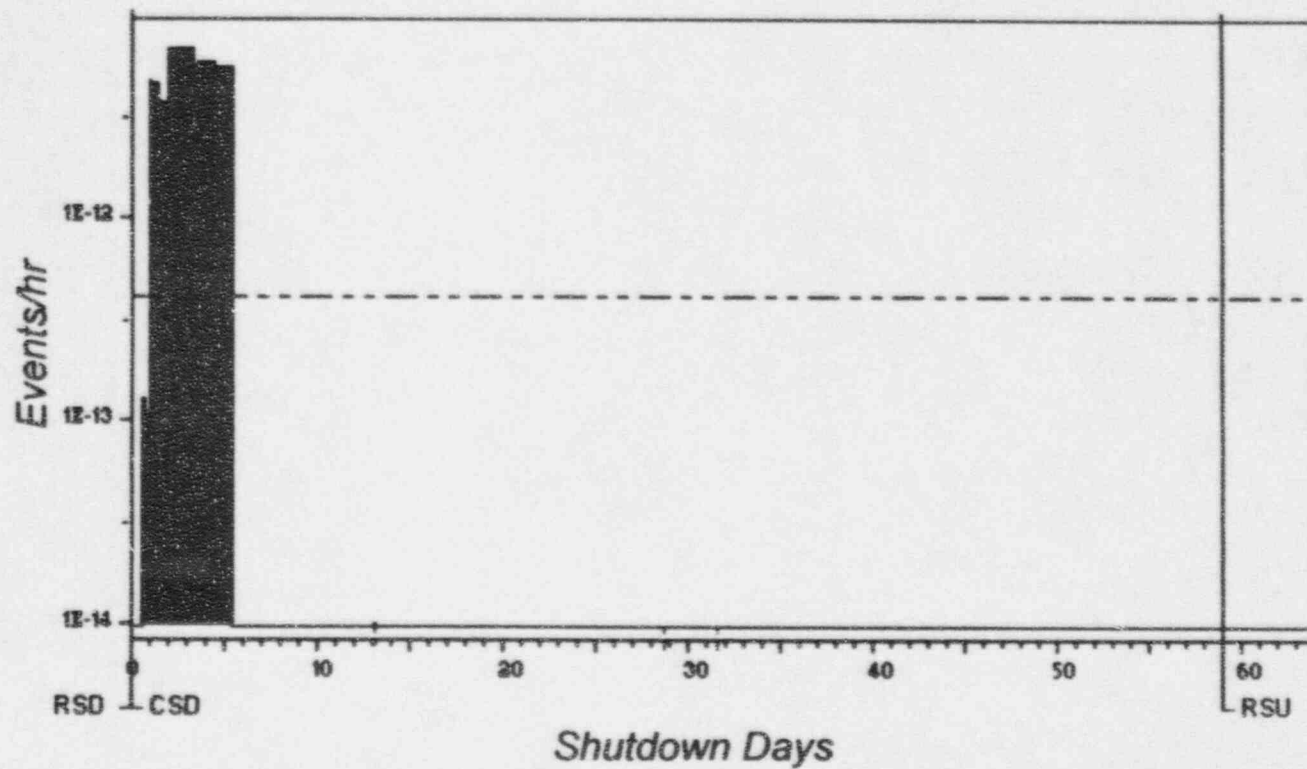


GGNS RF07

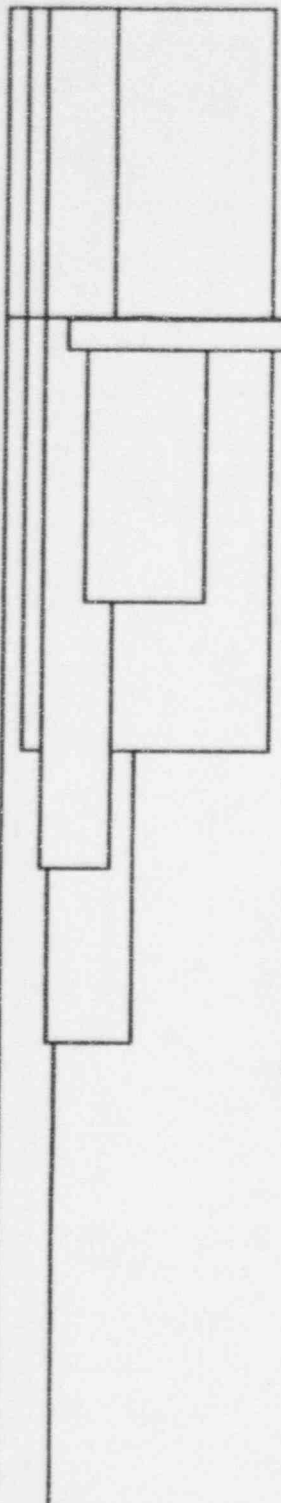
Core Damage Contributors



GGNS RFO7 Loss of DHR Core Damage Risk Profile



GGNS Shutdown to Power CDF Comparison



◆ Operating IPE Mean	1.67E-05 E/yr
Containment Failure Probability	33%
IPE with Containment Failure	5.56E-06 E/yr
◆ Average RFO7 CDF	2.29E-08 E/yr
% caused by Loss of DHR	3%
Average CDF for DHR	6.86E-10 E/yr

Barriers to Consequences from a Loss of DHR

- ◆ Only of concern during the early stages of an outage prior to vessel flood up and fuel handling
- ◆ Slow accident progression to core damage
- ◆ Following the NUMARC 91-06 guidance provides assurance that primary/secondary containment closure can be achieved consistent with plant conditions

Summary

Summary

- ◆ CDF associated with a loss of DHR is low (e.g., several orders of magnitude less than the IPE CDF with loss of containment)
- ◆ Requested TS change does not affect loss of DHR risk
- ◆ Following the NUMARC 91-06 guidance provides assurance that primary/secondary containment closure can be achieved consistent with plant conditions