July 26, 1995

MEMORANDUM TO: Theodore R. Quay, Director
Standardization Project Directorate
Associate Directorate for Advanced Reactors
and License Renewal
Office of Nuclear Reactor Regulation

FROM: Dino Scaletti, Project Manager
Standardization Project Directorate
Associate Directorate for Advanced Reactors
and License Renewal
Office of Nuclear Reactor Regulation

Original signed by

SUBJECT: SUMMARY OF MEETING HELD WITH THE NUCLEAR ENERGY INSTITUTE RELATED TO THEIR PROPOSED APPROACH TO THE FEASIBILITY OF USING THE NUREG-1465 SEVERE ACCIDENT SOURCE TERM AT OPERATING REACTORS

On June 1, 1995, the staff met with representatives of the NEI and six operating plant representatives to discuss the technical feasibility of using the NUREG-1465 severe accident source term at existing operating reactors.

Following the introductions and opening remarks, NEI presented the industry's action plan and schedule. NEI plans to develop a framework document covering the necessary procedures and technical guidance for individual plant applications of the NUREG-1465 severe accident source term, or parts thereof. NEI plans to submit the framework document to the staff as an Electric Power Research Institute document in September 1995.

During the meeting, certain issues were identified and question arose that will have to be addressed during the Nuclear Regulatory Commission (NRC) review process. These topics are identified in Attachment 1, which is an NEI list that was compiled following the meeting and sent to the NRC.

Presentations were made by the six pilot plant representatives; Indian Point 2, Millstone 3, Beaver Valley 1, Grand Gulf, Perry, and Browns Ferry. Each representative discussed their intent regarding the portions of the NUREG-1465 source term that they planned to implement for their facility. The first pilot plant submittal is expected early this fall.

Attachment 2 is a copy of the presentation view graphs and Attachment 3 is a listing of the meeting attendees. The next meeting on this topic is planned in late summer, 1995.

Project No. 689

Attachments:
As stated

cc w/attachments:
See next page

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OFFICE	LA:PDST:ADAR		PM:PDST:ADAR		SC:PDST:ADAR	
NAME	PShea		DScaletti:sg		JNWilson	
DATE	07/ /95		07/26/95		07/26/95	

cc: Mr. Sterling Franks
U.S. Department of Energy
NE-42
Washington, DC 20585

NEI MEETING ATTENDEES
JUNE 1, 1995

NAME	ORGANIZATION
Dino Scaletti	ADAR/PDST
Rich Emch	NRC/TERB
Charlie Miller	NRC/TERB
Charles Ader	NRC/AEB
Leonard Soffer	NRC/AEB
Ted Quay	NRC/PDST
Kathleen Hart	McGraw-Hill
Steve Lavie	Duqueshe Lkut
Sarah Pavlechko	Self
Ted Heatherly	Southern Tech Service
Mike Cheok	NUS
Kevin Borton	PECO Energy
Pete Kokolakris	NYPA
P.M. Abraham	Duke Power
Billl Horin	Winston & Straon
Pat Furio	Baltimore Gas & Electric
Nancy Chapman	Serch/Bechtel
Ralph Architzel	NRR/PDST
Rick Hasselberg	AEOD/ERB
Don McCamy	TVA/Browns Ferry
E.J. Weinkam	FPL/Turkey Point
Ray Crandall	Northeast Utilities
David Marzilli	Northeast Utilities
Steele Ferguson	Stone & Webster
Jay Lee	NRC/NRR
Barry Zalcman	NRC/NRR/PDST
Jason Schaperow	NRC/RES/DST
Mike Williams	NRR/SCSB
Joe Williams	NRR/PDII-3
Pedro Salas	TVA
Jim Metcalf	Polestar
Charles Jackson	Con Edison
Kurt Cozens	NEI
Alex Marion	NEI
Sheri Mahoney	Entergy-GGNS
Mike Withrow	Entergy-GGNS
Paul Reichert	Raytheon Engineers & Const.
Emin Ortalan	CEI-PNPP
David Lerner	Polestar
Bill Hopkins	Bechtel
John N. Ridgely	NRC/RES
Avtar Singh	EPRI

DRAFT

June 1, 1995 - NRC/NEI Source Term Meeting Questions/Comments

1. Current reviews of ALWR applications should not be considered as precedent setting relative to source term applications for operating plants.

2. Use of the revised source term with existing methods/criteria should be properly evaluated, i.e., reducing the release for immediate platcout by 50% is not consistent with NUREG-1465.

3. Any need to consider the impact of revised source term on IPE and severe accidents, especially if plant modifications are pursued?

4. Should the framework document address the recent rulemaking proposing TEDE dose limits, as opposed to those currently in 10CFR100.11? How would the two hour rolling window be addressed for releases not starting at the traditional t=0?

5. Would timing only be used for containment leak rate application?

7. Maintain distinction between timing and magnitude of release for selective applications.

8. Provide rationale for the primary consideration of Iodine and basis for not addressing other nuclides.

9. Provide adequate discussion for establishing levels of margin obtained using TID and NUREG (for partial and full applications), as well as current design basis and revised design basis.

10. Consider the merits of a workshop later this year at a point when NRC acceptance of framework document and a couple of pilot applications are achieved.

11. Consider the appropriate mechanism for NRC acceptance, e.g. administrative letter for the framework document, safety evaluations reports for the plant specific pilot applications, and use of 10CFR50.59 process.

12. Address other impacts beyond dose for the specific application where appropriate, e.g., operability and surveillance requirements associated with containment isolation valve closure times.

13. Pilot plants will pursue applications as safety enhancements to ensure high level of priority and management oversight.

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Attachment 1

NRC - NEI

PUBLIC MEETING

APPLICATION OF REVISED ACCIDENT SOURCE TERM TO OPERATING REACTORS

JUNE 1, 1995

1:00 p.m. - 4:00 p.m.

ONE WHITE FLINT NORTH

ROOM 8-B-11

Attachment 2

DRAFT

AGENDA

NRC/NEI MEETING ON REVISED SOURCE TERM

JUNE 1, 1995

Item	Topic	
1.	Introductions	
2.	Opening remarks	NRC/NEI
3.	Industry action plan and schedule	NEI
4.	Framework document	
	- Purpose and goals	NEI
	- Outline of framework document	EPRI
	- Discussion	All
5.	Pilot plants	
	- Identification	Utilities
	- Proposed demonstrations and schedules	Utilities
	- Resources	All
6.	Meeting Summary	NRC/NEI
7.	Adjournment	

IMPLEMENTATION OF REVISED SOURCE TERM

INDUSTRY ACTION PLAN AND SCHEDULE

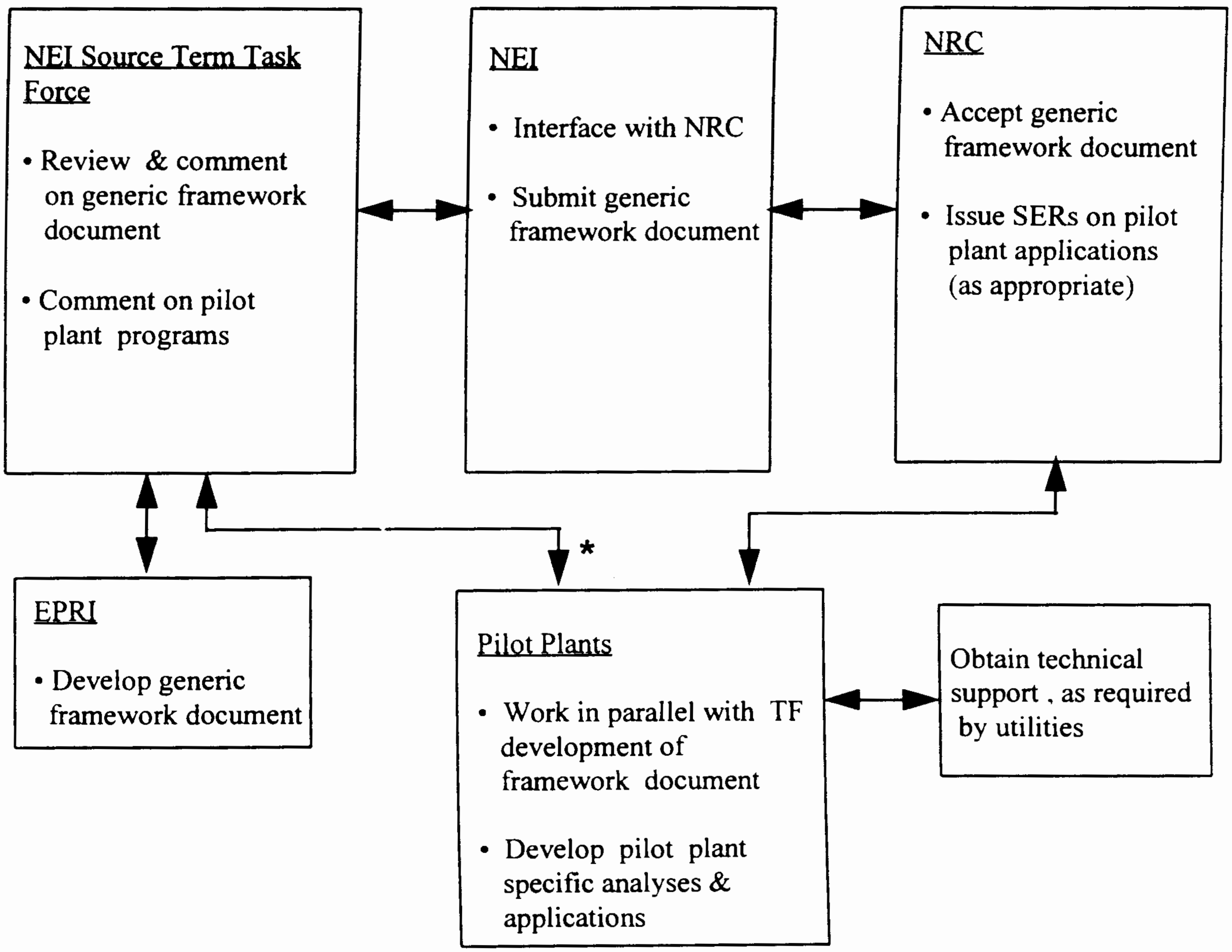
June 1, 1995

NEI

Background

- Met with NRC staff -- October 1994
- Industry positions
  - Revision to current regulations not necessary
  - Current licensing process (mechanisms) are sufficient
- Framework Document
  - Sufficient detail to:
    - » Assure consistent implementation
    - » Provide adequate technical guidance (identify necessary technical analyses and level of detail)
    - » Identify known cross-linked applications
  - NUREG-1465 may be implemented on a selective basis
- Pilot plants examples demonstrate implementation process

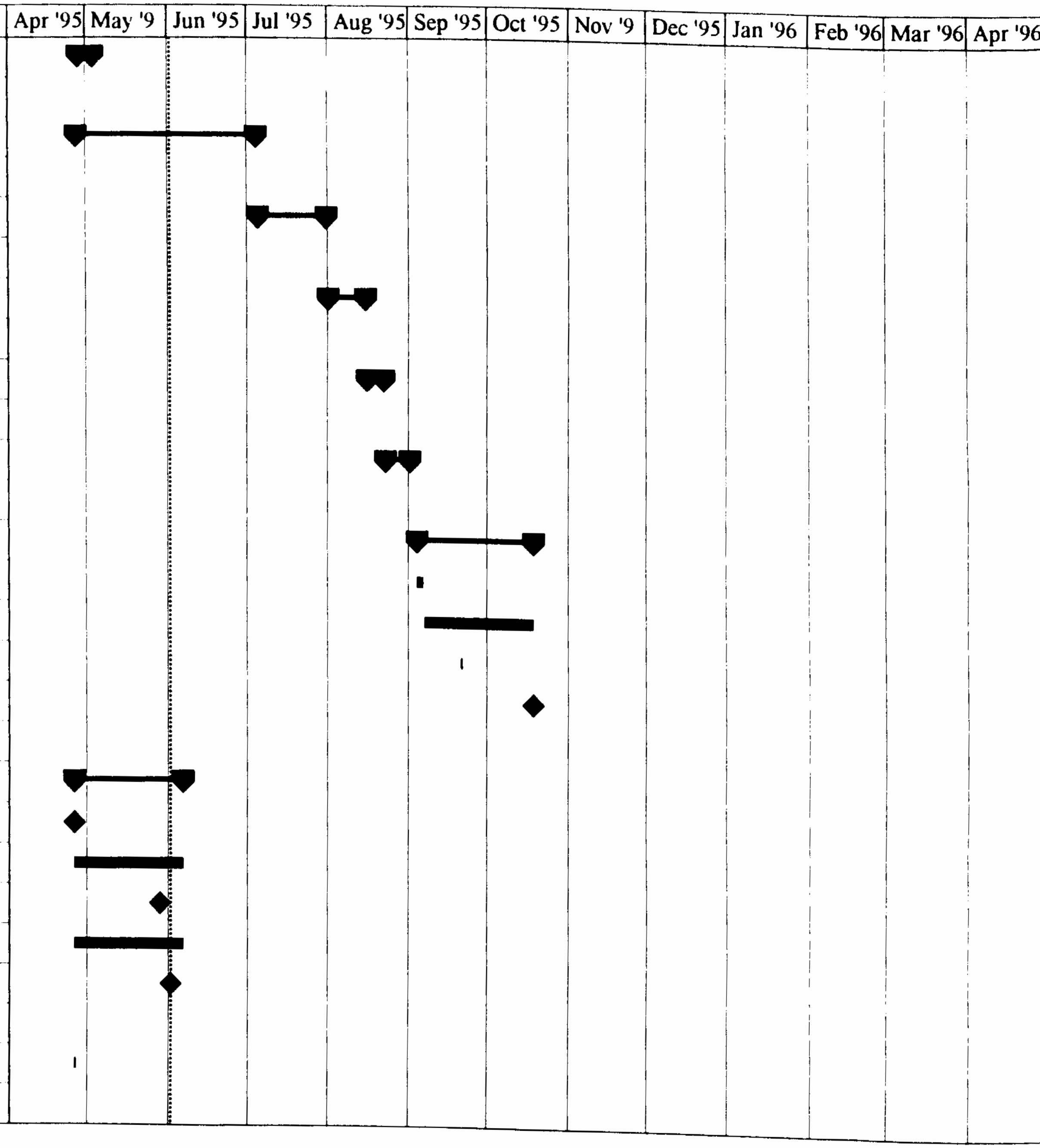
SOURCE TERM IMPLEMENTATION RELATIONSHIPS



*Information exchange

NEI

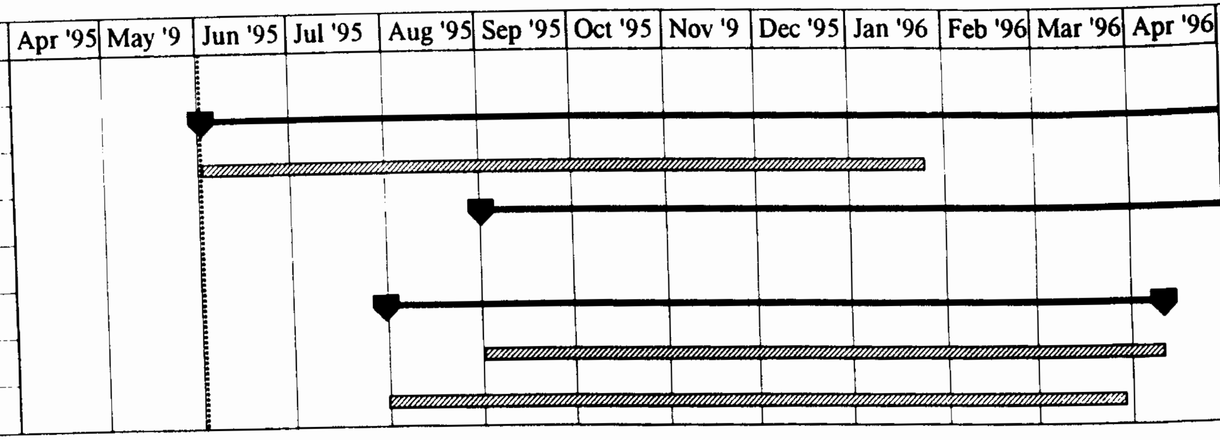
ID	Name
1	Intial Task Force Efforts
5	
6	Develop framework document
14	
15	Review of document
20	
21	Revision of framework document
24	
25	Final Review
29	
30	Final revision
33	
34	NRC Review
35	NEI transmits document to NRC
36	NRC reviews and accepts document
37	NRC meeting
38	NRC accepts framework document
39	
40	Preliminary pilot plant program
41	Identification of potential pilot plants
42	NEI discuss details of demos with utilities
43	Finalize identification of pilot plants
44	Pilot plants initiate program efforts
45	Discuss pilot plant demonstrations NRC
46	
47	
48	



Project: Source Term Framework Docummen
Date: 6/1/95

Critical
Noncritical
Progress
Milestone
Summary
Rolled Up

ID	Name
49	
50	Pilot plant demonstrations
51	Develop plant specific analysis and NRC submittals
52	Submit pilot plant analyses to NRC for acceptance
55	
56	NRC approval of pilot plant demonstrations
57	Review pilot plant submittals
58	Pilot plants interact with NRC



Project: Source Term Framework Document
Date: 6/1/95

Critical
Noncritical
Progress
Milestone
Summary
Rolled Up

EPRI Framework to Support NEI/Industry Initiative for Application of Revised Source Term to Operating Plants

Dr. Avtar Singh
EPRI

Mr. James Metcalf
Dr. David Leaver
Polestar Applied Technology, Inc.

Industry/NRC Meeting
Washington, DC, June 1, 1995

Topics for Discussion

- Description of the EPRI Project
- General Aspects of the Revised Source Term
- Generic Methodology for Application of Revised Source Term
- Conclusions

Description of the EPRI Project

Purpose of Project - to support licensee efforts to apply the revised source term to achieve safe, cost beneficial changes to operating plants

Phase 1 Objective

- To develop a generic framework to support the NEI/Industry initiative for the application of the revised source term to operating plants
  - To define application boundaries
  - To address technical aspects related to such applications
  - To obtain NRC review via NEI
  - To develop example applications using the generic framework
  - To prepare a report documenting the generic framework

Description of the EPRI Project (continued)

Phase 2 Objectives

- Support pilot applications by individual or groups of licensees
  - To be defined during Phase I
- Support interactions with and between NEI/ NRC on content and review of pilot (and future) applications
- Develop methodology for detailed application of the revised source term

EPRI/NPG

Description of the EPRI Project (continued)

Outline of Framework Document

1.0 Introduction

2.0 Potential Areas of Plant Change

3.0 Review of Current DBA Source Terms vs. NUREG 1465 Source Terms

4.0 General Aspects of Application of Revised Source Term to Operating Plants

5.0 Suggested Scope of Analysis for Timing Only

6.0 Suggested Scope of Analysis for Chemical/Physical Form Only

7.0 Suggested Scope of Analysis for Other Applications

Presentation will focus mainly on 4, 5, and 6.

Safety & Reliability Assessment Target

EPRI/NPG

General Aspects of Revised Source Term

Key questions

- How do differences in timing, chemical form, and release fractions affect offsite and onsite dose calculations done per 10CFR100, TID-14844, and applicable regulatory guidance?
- How can the revised source term be exercised in selected (i.e., limited) applications but in a logical, internally consistent, and integrated way?

Safety & Reliability Assessment Target

EPRI/NPG

General Aspects of Revised Source Term (continued)

Fundamental principles

- Complete substitution of NUREG-1465 (for TID 14844 and applicable guidance) is acceptable
- Continued use of existing licensing design basis analyses is acceptable

Subsidiary Principles

- Existing licensing methods (i.e., applicable reg. guidance) are acceptable but other methods can be used if adequately justified
- Consistency of application between the existing and revised DBA source terms will be maintained, i.e., aspects which increase dose as well as aspects which decrease dose must be considered in the technical justification
- External exposure whole body dose and thyroid dose calculations (as required by 10CFR100.11) are consistent with the existing licensing design basis and provide adequate control of design

EPRI/NPG

General Aspects of Revised Source Term (continued)

Scope of Revised Source Term Effort

- Fuel Damage Events (DBA LOCA, non-DBA LOCA gap release events)
- Transport, deposition, delay, and release methods in conjunction with NUREG 1465 will be addressed
- Existing licensing approaches will be used for dispersion issues (e.g., on-site dispersion for control room and TSC dose assessments)

Comments on Applicability of NUREG-1465 to Operating Plants

- SECY-94-300 extends invitation for voluntary use of NUREG-1465 source terms on operating plants
- When used as a 10CFR100 DBA source term specification for operating plants the release will consist of the gap plus early in-vessel components (consistent with the SECY-94-300 policy for ALWRs)
- It is planned that gap release fractions from NUREG-1465 will be used in other non-DBA fuel-damage source term specifications

Margin Evaluation and Use of 10CFR50.59

- Two types of margin:
  - How does use of a revised source term for a limited application (i.e., the revised licensing design basis [RDB]) compare to appropriate implementation of NUREG-1465 for dose calculations ? (Justification for the revised source term)
  - How does final result using the RDB + change in plant configuration compare to existing licensing design basis? (Justification for maintenance of existing margin and/or finding of no unreviewed safety question)
- It is desirable to clarify the circumstances under which 10CFR100.11 (and related) source terms can be changed so as to result in a 10CFR50.59 determination that a proposed change in plant configuration does not constitute an unreviewed safety question
  - This clarification should emerge from the pilot applications of the revised source terms to operating plants

Timing-Only Application

Overall Approach

- Use of a revised licensing design basis (RDB) source term
  - Timing-only applications will use existing design basis source term (e.g., the RG 1.3/1.4 methods) with a change only in the timing of the release
  - Release fractions and release chemical/physical form will remain the same
  - For cases where the total dose is made up of several individual contributions some may be left as-is
  - Analyses of record will be done using existing methods on the basis of the margin evaluation (i.e.,additional NUREG-1465 radionuclides and time-dependent-only removal contribute negligibly to dose)

Timing-Only Application (continued)

Overall Approach (cont'd)

- Justification for change to the existing licensing design basis

Option 1

- Comparison of relevant dose "index" (e.g., airborne I-131 dose equivalent [DE/I-131] inside containment) for RDB with that from NUREG-1465
- Comparison will illustrate margin inherent in approach (i.e., that the RDB gives higher dose index and thus is a conservative representation of NUREG 1465)

Option 2

- For reasonable changes, an even simpler justification (e.g., by qualitative means) should be acceptable

Timing-Only Application (continued)

Example timing-only applications

- Extension of allowable draw-down time for secondary containments
- Extension of allowable start-times for mitigation systems designed to remove activity from containment atmosphere
- Extension of allowable time to effect complete isolation of containment

Chemical/Physical Form-Only Application

Overall approach

- Use of an RDB source term
  - Chemical/physical form-only applications will use existing licensing design basis source term (e.g., the RG 1.3/1.4 methods) with a change only in the chemical (and therefore, physical) form of the iodine
  - Release fractions and release timing will remain the same
  - For cases where the total dose is made up of several individual contributions some may be left as is
  - Analyses of record will be done using existing methods except where relief is specifically sought (i.e., additional NUREG-1465 radionuclides and change from gaseous iodine removal rates to particulate iodine removal rates contribute negligibly to dose)

Chemical/Physical Form-Only Application (continued)

Overall approach (cont'd)

- Justification for change to the existing licensing design basis
  - Comparison of a relevant dose "index" (e.g., DE/I-131 inside containment) for RDB to this dose index for NUREG-1465
  - Comparison will illustrate margin inherent in approach (i.e., that the RDB gives higher dose index and thus is a conservative representation of NUREG 1465)
  - Importance of pH control is recognized in suppressing formation of gaseous iodine -- will be addressed

Conclusions

- Safe, cost beneficial operating plant changes can be justified using the revised source term
- A sound, integrated technical and licensing approach is being developed for applying the revised source term to operating plants
  - Methods of existing licensing design basis are acceptable but other methods can be used if adequately justified
  - An acceptable way to justify change to the source term (i.e., the RDB) is on the basis that it is conservative relative to NUREG 1465 application
  - Maintain consistency of application, (i.e., aspects which increase dose as well as aspects which decrease dose must be considered)
  - Existing 10CFR100 whole body and thyroid dose requirements provide adequate control of design

AGENDA

NRC/NEI MEETING ON REVISED SOURCE TERM

JUNE 1, 1995

Item	Topic	
1.	Introductions	
2.	Opening remarks	NRC/NEI
3.	Industry action plan and schedule	Kurt Cozens
4.	Framework document	
	- Outline of framework document	Avtar Singh Dave Leaver
	- Discussion	All
5.	Pilot plants (Identification, Proposed demonstrations and schedules)	Dino Take a 10 min break
	- Indian Point 2	Charlie Jackson
	- Millstone 3	Ray Crandall
	- Beaver Valley 1	Steve LaVie
	- Grand Gulf	Mike Withrow
	- Perry	Emin Ortalan
	- Browns Ferry	Pedro Salas
	- Resources	All
6.	Meeting Summary	NRC/NEI
7.	Adjournment	

APPLICATION OF REVISED SOURCE TERMS

FOR

PERRY NUCLEAR POWER PLANT

CLEVELAND ELECTRIC ILLUMINATING COMPANY

JUNE 1995

OBJECTIVE

ELIMINATE MSIV-LCS USING BWROG METHODOLOGY

INCREASE:

- ESF LEAKAGE
- MSIV LEAKAGE
- BY-PASS LEAKAGE

REDO CHARTER 15 LOCA OFFSITE/CR DOSE ANALYSES

GOAL IS TO MAINTAIN CURRENT DOSES

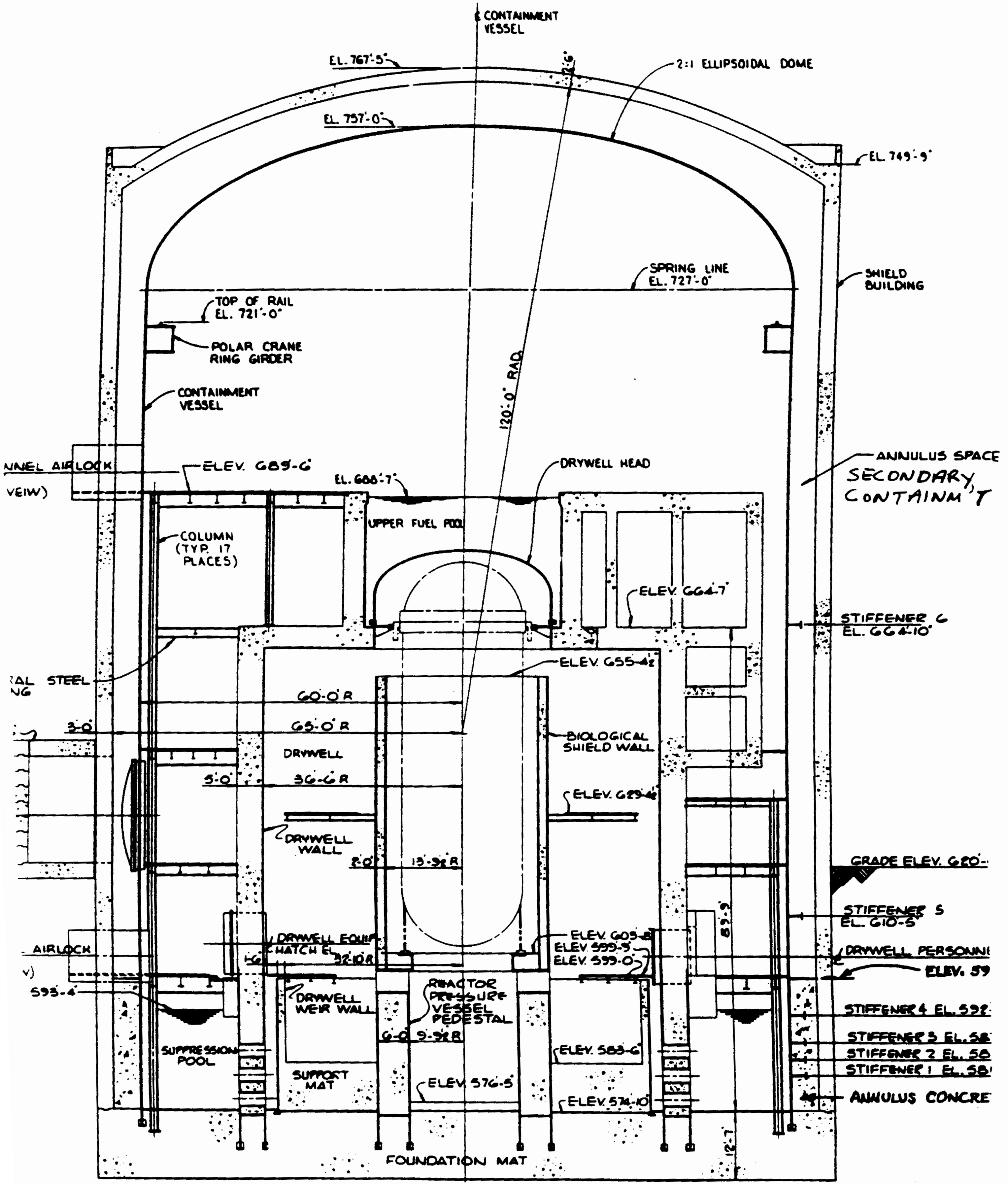
UNIQUE DESIGN FEATURES

PERRY DOES NOT HAVE A CONVENTIONAL SECONDARY CONTAINMENT OVER ECCS SYSTEMS

SECONDARY CONTAINMENT IS OVER THE CONTAINMENT - BWR 6, MARK III

SCHEDULE

SUBMIT LICENSE AMENDMENT	MID 1996
EXPECT SER BY RFO-6	SEPT 1997



CONTAINMENT VESSEL
EL. 767'-5"
2:1 ELLIPSOIDAL DOME
EL. 757'-0"
EL. 749'-9"
SPRING LINE EL. 727'-0"
SHIELD BUILDING
TOP OF RAIL EL. 721'-0"
POLAR CRANE RING GIRDER
CONTAINMENT VESSEL
120'-0" RAD.
ANNULUS SPACE
SECONDARY CONTAINM'T
ELEV. 689-6
EL. 688'-7"
DRYWELL HEAD
UPPER FUEL POOL
COLUMN (TYP. 17 PLACES)
ELEV. 664-7
STIFFENER 6 EL. 664-10
ELEV. 655-4
60-0 R
65-0 R
BIOLOGICAL SHIELD WALL
DRYWELL
36-6 R
ELEV. 629-4
DRYWELL WALL
GRADE ELEV. 620-
STIFFENER 5 EL. 610-5
DRYWELL EQUIP. HATCH EL.
ELEV. 605-8
ELEV. 599-5
ELEV. 599-0
DRYWELL PERSONNEL
AIRLOCK
593-4
REACTOR PRESSURE VESSEL PEDESTAL
DRYWELL WEIR WALL
STIFFENER 4 EL. 592
STIFFENER 3 EL. 58
STIFFENER 2 EL. 58
STIFFENER 1 EL. 58
SUPPRESSION POOL
ELEV. 583-6
SUPPORT MAT
ELEV. 576-5
ELEV. 574-10
ANNULUS CONCRE
FOUNDATION MAT

BROWNS FERRY APPLICATION OF REVISED SOURCE TERM (NUREG-1465)

TVA intends to use the reactor accident source terms provided in NUREG-1465 for radiological consequence assessments in the area of control room habitability and site boundary doses. From this evaluation, TVA expects to implement the following changes to the plant design and configuration:

- Increased allowable Main Steam Isolation Valve leakage rate, and

- Removal of Technical Specification requirements for charcoal filters from Standby Gas Treatment and Control Room Emergency Ventilation Systems.

TVA is committed to support a pilot project within the scope and schedule of the EPRI Generic Framework. TVA expects to complete its plant specific analysis and NRC submittal by October 1995 and will request approval by the end of March 1996.

Beaver Valley Power Station

Containment Operating Pressure License Amendment

Stephen F. LaVie
Sr. HP Specialist --
Radiological Engineering

Duquesne Light

AXCNMT01.PR3

BVPS CNMT Project

- **Scope**
  - Duquesne Light Is pursuing a project to change the design basis of the Beaver Valley Power Station Unit 1 and Unit 2 containment from sub-atmospheric to atmospheric

- **Approach**
  - Re-analyze CNMT pressure transient response using RELAP5/MOD3
  - Apply NUREG-1465 to radiological consequence assessments for DBA accidents involving core damage

BVPS CNMT Project

- Source Term Components to be Addressed
  - Re-analysis will address all components (timing, chemical form, quantity, nuclide grouping)
- Other
  - Calculate ICRP-26/30 dose quantities
  - Run ORIGIN for extended burn fuel inventory
  - Analyses by AE (SWEC), NSSS (W), utility
    - *SWEC implemented NUREG-1465 for ABB-CE System 80+ Certification*

AXCNMT01.PR3

2

BVPS CNMT Project

- **Benefits**
  - Personnel safety improvement
  - Reduced O & M Costs
    - *outage duration, oxygen supplying respirators, maintenance efficiency*
  - Improvement in some margins
    - *NPSH, Postulated Offsite Doses, others*
  - Future cost-beneficial station modifications made possible
- **Schedule** *(tentative)*
  - License amendment submittal in 1st quarter 1996
  - Implement during late 1996 / early 1997

AXCNMT01.PR3

Indian Point 2
Proposed Pilot Program

NUREG - 1465 Source Term

June 1, 1995

NUREG - 1465 Source Term

Indian Point 2 Proposed Pilot Program

- Recalculate FSAR Analyses With Revised Source Term

- Utilize The Following NUREG - 1465 Features:
  - Iodine Chemical Species
  - Fission Product Release Timing
  - Fission Product Release Phases Through Early In-Vessel
  - Fission Product Release Fractions
  - Fission Product Groups

- Acceptance Criteria
  - 10CFR100 Offsite Doses - Thyroid And Whole Body
  - FSAR Criteria For Control Room - Thyroid And Whole Body

NUREG - 1465 Source Term

Indian Point 2 Proposed Pilot Program

- Applications
  - Remove Charcoal And HEPA Filters From Containment Fan Cooler Units
  - Remove NaOH Additive From Containment Spray System (Install Dry TSP In Containment Basement)

NUREG - 1465 Source Term

Indian Point 2 Proposed Pilot Program

- Proposed Schedule
  - Submit Dose Calculations
    August/September 1995
  - Submit Technical Specification Changes For
    Applications October/November 1995
  - NRC Issues License Amendment For Applications
    August 1996

MILLSTONE UNIT 3

PILOT PLANT APPLICATION

NUREG 1465 SOURCE TERM

TIMING ONLY OPTION

RAY CRANDALL
SUPV. - RAD ENG
JUNE 1995

TECNICAL SPECIFICATION CHANGE REQUEST

SECONDARY CONTAINMENT VENTILATION SYSTEMS

-CHANGE TIME FOR NEGATIVE PRESSURE REQUIREMENT TO 30 MINUTES

-DELETE AUTO START REQUIREMENT, AT LEAST FOR LNP EVENT

REANALYSIS

MP3 LOCA AND
CONTROL ROD EJECTION

EAB, LPZ AND
CONTROL ROOM DOSES

SAME CODES

GAP ACTIVITY AT T=30SEC

REG GUIDE 1.4 SOURCE AT
T = 30 MIN

SAME TREATMENT OF
IODINE REMOVAL BY SPRAYS
NO CREDIT FOR SECONDARY
CONT. FILTERS FOR 30 MIN.

SCHEDULE

START WHEN GROUNDRULES
FOR TIMING APPLICATION
ARE ESTABLISHED

1 TO 2 MONTHS TO PREPARE
TECH SPEC CHANGE, PERFORM
REANALYSIS, WRITE SAFETY
EVALUATION/SHC

1 MONTH FOR INTERNAL REVIEWS
AND TRANSMITTAL LETTER

THEREFORE,IF GROUNDRULES
READY IN JULY, SUBMITTAL
IN SEPT/OCT

BENEFITS

ELIMINATE COMPLICATED AUTO START LOGIC - IMPROVES OVERALL RELIABILITY OF VENTILATION

IMPROVE MARGIN ON DIESEL GENERATOR LOADING

ELIMINATE NEED FOR EMERGENCY TECH SPEC CHANGES PREVIOUSLY CAUSED BY DIFFICULT TO MEET DRAWDOWN REQUIREMENTS

IMPROVE CAPACITY FACTOR BY AVOIDING LCO SHUTDOWNS UNJUSTIFIED BY ACTUAL SAFETY SIGNIFICANCE

GGNS Pilot Application

NEI/NRC Meeting
on
Revised Source Terms

June 1, 1995

Mike Withrow
Entergy Operations
Grand Gulf Nuclear Station

GGNS Accident Source Terms Key Assumptions

- Appropriate margins will be maintained
- Analysis insights will be incorporated into the design, maintenance, testing and operating procedures
- Onset of gap releases will be based on GGNS-specific MELCOR analyses
- For design basis purposes, the accident progression ends after the early in-vessel release phase
- Resolution of technical issues (e.g., pool pH and high burnup fuel) will be consistent with industry guidelines
- Pilot applications will provide significant safety, operating dose and/or cost benefits

GGNS Pilot Application

Elimination of the automatic isolation function of selected primary and secondary containment penetrations

- Penetrations that do not communicate directly with a contaminated atmosphere
- Provides a net safety benefit through reduced core damage frequency
- Improves overall plant reliability by removing spurious loss of function trips during power operations
- Penetrations would be remote manually isolated from the control room as plant conditions dictate

GGNS Pilot Application

Relaxation of the general automatic containment isolation valve closure times

- Current stringent closure times add no value (at excess cost) under realistic source term timing
- Provides cost and station dose benefits by decreasing valve maintenance requirements
- Can lead to reduced stresses and effects on bus voltage levels by re-gearing valve actuators to allow for slower stroke times

GGNS Pilot Application

Elimination of the control room standby fresh air system

- Based on maintaining existing SGTS capabilities that serve the same function under realistic source term assumptions
- Provides cost benefits by reducing surveillance and maintenance requirements
- Can lead to a reduced overall heat load in the control room envelope